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ABSTRACT

Part of an articulated curriculum for grades K-12, this fifth grade resource unit, the first in a series of regional studies, provides an overview to the study of geography of the U. S. Program descriptions, course objectives, teaching strategies, and an explanation of format are presented in the teacher's guide, ED 062 226. Students, emulating the skills of the geographer, examine and compare a series of map patterns in the United States and work out a system of four regions according to selected criteria. Then, in the subsequent units, pupils focus on case studies rather than on a detailed study of each region. Emphasis is upon students developing map skills and, further, upon drawing inferences from a comparison of different map patterns. Activity units are suggestive rather than prescriptive, and the teacher is encouraged to add other activities and materials and to consider the ability, previous experience, and interests of the class. Related documents are ED 061 134, ED 062 227, and SO 002 732 through SO 002 741. (Author/SJM)

Grade five
Unit: The United States: An Overview

RESOURCE UNIT

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INTRODUCTION TO UNIT

This unit serves as an overview to the study of the geography of the United States. More specifically, it provides a view of the United States as a whole before pupils study the case studies showing sequent occupance in individual cities or the regions in which these cities are located. The overview also helps pupils understand the concept of regionalization.

This is a resource unit. The teacher should not attempt to teach all of the suggested activities. Hopefully, she will add other activities and materials to those suggested. As she selects activities and builds a teaching unit from this resource unit, she should consider such factors as the following:

(1) The general ability level of the class. (If the class is below average in ability, the teacher may wish to omit all of part three as well as some of the more difficult activities designed to teach other sections of the unit.)

(2) The differing abilities and interests of class members. (This criterion is particularly important in selecting some of the individual activities or in deciding how to group the class for particular activities and for needed review exercises.)

(3) Previous experiences of pupils in the class. (The selection of activities will depend in part upon (a) previous experiences of pupils outside of school, including their travel experiences or where they have lived in earlier years and (b) earlier school experiences. Particularly important here is whether or not pupils have studied the earlier courses prepared by the Curriculum Center at the University of Minnesota. The Center's Kindergarten course focuses upon geography, and each of the first four grades teaches many geographic concepts and generalizations about the communities studied or the places where the different families studied live. Indeed, these communities and families have been chosen in part to illustrate different kinds of site concepts. The activities in this resource unit frequently indicate that some idea is to be reviewed if pupils have come through the earlier courses. If the children have not studied the ideas earlier, the teacher should probably use some of the optional activities designed to teach the concepts or generalizations. If they have studied the earlier courses, the teacher will want to ask questions designed to get pupils to apply previously-learned concepts and generalizations to the new data. To help the teacher identify ideas which are reviewed and those which are introduced for the first

time, new generalizations and concepts are starred in the list of objectives.

If pupils have come through the earlier courses in the Center's curriculum, this overview can be taught quickly. However it will take longer if many of the ideas must be introduced for the first time.

(4) Materials available for the course. (Some procedures will have to be omitted if needed materials are not available or if others cannot be substituted. Many substitutes can be found in texts and maps and audio-visual materials already available in a school system. It is impossible to mention all sources for maps or pictures in the materials section of this resource unit. The teacher can also add to materials as the year progresses and so be able to teach more of the activities a second year.)

(5) Community resources available. (Some communities have useful museums with many exhibits to teach some of the concepts suggested in this overview or with useful exhibits of globes and maps. Some also have a number of people who can serve as resource people about different parts of the country or who have slides or movies which they may be willing to loan to the school. Moreover, the teacher should consider working through the school principal and PTA in a drive to collect old magazines such as National Geographic and Arizona Highways for use in the classroom.)

(6) The need for variety in procedures. (Variety is needed both for the sake of maintaining interest and to achieve the different goals for the unit. Since teachers are expected to add activities and choose from among those in this unit, they must make sure that they provide for variety without interrupting the flow of the unit. When the teacher omits three or four of the activities in the present unit, she may also be omitting the suggestions built into the activities to help pupils understand the flow of the unit; if so, she must build in her own transitions from one activity to another.)

The format of this resource unit is designed to help teachers see the relationships between objectives, content, teaching procedures, and materials. The first column on objectives indicates why an activity should be taught and helps the teacher focus the activity. The second column indicates the content which is to be used to achieve the objective. The third column suggest the activity which might be used to teach the content and achieve the objectives, and the fourth column suggest materials

which can be used to handle the procedure. If no objective appears in column one opposite an activity, the teacher should look up the column to the last objectives indicated for any one procedure. Objectives are not repeated from one activity to another until different objectives intervene. The bibliography at the end of the unit provides more complete bibliographical data than can be included within the body of the unit.

OBJECTIVES

This unit should make progress toward developing the following objectives:*

CONCEPTS

1. Globalism: rotation of earth, inclination of earth, revolution of earth around sun; seasons, ocean currents,* prevailing winds.*

2. Location:

   a. Position: longitude, latitude, high latitudes,* middle latitudes,* low latitudes,* meridian, parallels.

   b. Situation: distance, direction, relationships.

   c. Site: elevation; landforms (plains, hills, mountains, plateaus, valley, gorge, mesa, butte); water (river, drainage,* evaporation,* precipitation, hydrological cycle*); climate (temperature, growing season, seasonal variations, precipitation); soil (types, erosion); vegetation (coniferous and deciduous forests, tall grasslands, short grasslands, desert, tundra).

3. Cultural use of environment: political boundary, population density, argicultural types, predominant economy,* urbanization, industrial development.

4. Diversity-variability: patterns;* region.*

5. Change: physical, biotic,* man-made.

6. Interrelatedness: areal association;* trade.

GENERALIZATIONS

1. Every place has three types of location: position, situation, and site.

*Introduced for first time in this curriculum. Others are reviewed from earlier courses, with activities designed to increase depth of understanding.

a. Places can be located in terms of their situation; situation describes a phenomenon in areal relationship with other phenomena with which it is associated, including distance and direction from such phenomena.

b. Things can be located at specific points on the earth's surface, usually designated by an abstract grid and described in terms of latitude and longitude.

c. Places can be located in terms of site which relates a pheonmenon to the detailed physical setting of the area it occupies.

2. Phenomena are distributed unequally over the earth's surface, resulting in great diversity or variability from one place to another. No two places are exactly alike.

*a. Unevenly-distributed phenomena form distinctive patterns on the map.

*3. Temperature is affected by such factors as distance from the equator, elevation, distance from warm water bodies, prevailing winds, and physical features which block winds from certain directions.

a. Temperature and seasonal differences are affected in part by distance from the equator; temperature ranges

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are smaller near the equator than further away from it.

b. Temperature is affected in part by elevation; air is cooler at higher elevations than at lower elevations if latitude and distance from the sea are the same.

*c. Places in the interior of continents tend to have greater extremes of temperature than places along the coast.

1) The ocean and other large bodies of water do not heat up so rapidly as land nor cool so rapidly as land.

*2) Winds which blow over warm bodies of water (or land areas) carry warm air to nearby land areas.

*4. Precipitation is affected by factors such as distance from bodies of warm water, wind direction, temperature, ocean currents, and physical features which force winds to rise.

*a. Warm air can hold more water than cool air; therefore warm air picks up moisture and the cooling of air leads to precipitation.

*b. Winds which have been warmed and have

time in the curriculum. The others are reviewed. If part
starred is underlined, only the underlined part is intro-

1. . . picked up moisture crossing large bodies of warm water tend to cool as they rise over mountains and so drop their water on the side of the mountain from which they come.

*c. As winds descend into valleys from mountain ridges, they are warmed and tend to pick up moisture.

*d. Winds which cross cold water currents are cooled and will pick up moisture rather than dropping it as they cross land areas which are warmer than the water.

*5. The amount of moisture needed for vegetation and crops is affected by the time of year when the area receives most of its moisture and by the temperature of an area.

*a. The time of year when an area receives its precipitation is important to agriculture. If it comes during the growing season, it makes it easier to grow crops; however, if it comes mainly at the hotest time of the year, more is needed than during cool months to provide an equal amount of moisture.

*b. The land in hot regions dries fast as the warm air picks up moisture; therefore more rain is needed to grow crops in these regions than in regions which are not so hot.

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*6. Water is evaporated from the ocean, is carried in clouds by the wind, is dropped on land areas through precipitation, and is then evaporated once more or runs off by way of rivers and underground streams to the oceans.

a. Rivers flow from higher elevations to lower elevations.

*b. If lakes have no outlets, they are likely to develop into salt-water lakes or dry up into salt beds.

7. The rotation and inclination of the earth and the revolution of the earth around the sun have a number of effects upon climate.

a. The rotation of the earth produces day and night, while the inclination of the earth and its revolution around the sun result in seasons and differences in temperature on the earth's surface.

*b. The direction of prevailing winds is caused both directly and indirectly by the rotation of the earth and its revolution around the sun.

*1) Differences in air temperature lead to movements of air and winds. As warm air rises, cooler air moves in to replace it.

*c. The ocean currents are caused largely by the direction of prevailing winds and the rotation of the earth.

8. Vegetation is affected by temperature, precipitation, and soil.

   a. Trees need more water than long grasses in order to grow; long grasses need more water than shorter grasses.

   b. Grass will grow in some areas which are too cold for trees to grow.

   c. Deserts have very little rain and precipitation is very irregular from one year to another.

   *d. Differing crops need differing amounts of rainfall and differing temperatures and number of frostfree days in order to grow; they need water and dryness at different times during their period of growth.

   e. Vegetation and what can be grown is affected in part by soil.

*9. Soil in a particular place is affected by the type of basic rock in the region, the climate, vegetation, erosion, wind, glaciers, and rivers which move soil, as well as by how man treats the soil.

   *a. Erosion of soil results from water and wind; it is more likely in areas where grass and trees have been removed.

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*10. Nature changes the face of the earth through physical and biotic processes.

a. A river which moves rapidly carries with it much sediment and frequently cuts deep valleys.

*b. A river which moves slowly across a plain drops gravel and sand that it has moved from higher areas.

c. See 9 above.

11. Man uses his physical environment in terms of his cultural values, perceptions, and level of technology.

a. Man changes the character of the earth.

b. Machinery and power make possible greater production per person.

*c. Political boundaries are man-made and frequently do not follow any natural physical boundaries.

*12. Population is distributed unevenly over the earth's surface; many of the land areas are thinly populated.

*a. Men carry on more activities on plains than in hills and more in hills than in mountains except in the low latitudes.

*b. Moist areas tend to have a higher population density than dry areas. However, population distribution reflects man's values and his technology as well as physical features of an area.

c. Large cities are characterized by a large number of people per square mile.

*d. A number of factors -- climate, surface features, natural resources, accessibilty, and history -- affect settlement patterns.

13. Some things can be produced better in one place than in another because of climate, resources, transportation routes, access to resources, access to markets, people's skills, etc.

*a. The value of land tends to be related to a number of factors such as moisture, soil, temperature, and growing season, population density, and transportation facilities.

*b. Power for industry is obtained from the use of coal, oil, natural gas, water, and nuclear energy.

*c. Forests can be used to obtain lumber and other timber products such as paper, turpentine, nuts, etc, depending upon the kinds of trees in the forest.

14. People in mo
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14. People in most societies of the world depend upon people who live in other communities, regions, and countries for goods and services and for markets for their goods.

*15. A region is an area of one or more homogeneous features. The core area is highly homogeneous, but there are transitional zones where boundaries are drawn between different regions.

*a. Regions are delimited on many different bases, depending upon the purpose of the study. Some are delimited on the basis of a single phenomenon, some on the basis of multiple phenomena, and some on the basis of functional relationships.

*16. Geographers seek information about areas on the earth's surface which enables them to compare, synthesize, and generalize about these areas.

*a. Geographers ask different questions about places, depending upon their purposes at the moment.

*17. All maps contain distortions of one kind or another; each kind of map projection has both advantages and disadvantages, depending upon one's purpose in using a map.

18. Maps make it possible to discern patterns and relationships among a vast amount of data.

*d.

SKILLS

*e.

The broad skill toward which teaching is ultimately directed is underlined. A specific aspect of a skill or an understanding needed to learn a skill is in plain type.

3. Use

a.

1. Attacks problems in a rational manner.

   a. Sets up hypotheses.

   b. Figures out ways of testing hypotheses.

b.

2. Gathers information.

   a. Gains information by studying pictures.

c.

   b. Gains information by observing the world around him.

   c. Gains information by conducting simple experiments.

   d. Gains information by using models.

   e. Gains information by making a survey.

      *1) Increases the accuracy of his observations through the use of de-

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vices to promote reliability such as a questionnaire.

*d. Interprets pictographs, bar graphs, line graphs and circle graphs.

*e. Uses scatter diagrams to test hypotheses.

3. Uses effective geographical skills.

a. Has a sense of distance and area.

1) Compares distances.

2) Compares areas.

b. Has a sense of direction.

Knows cardinal directions.

Knows intermmediate directions.

c. Interprets maps.

1) Interprets map symbols.

a) Interprets map symbols (color layers) in terms of map legend.

*b) Interprets map symbols (color gradients and shading).

*c) Interprets map symbols (isometric lines) in terms of map legend.

*d) Interprets map symbols (contour lines).

2) Uses map scale to estimate distances.

*3) Differentiates between small scale and large scale maps and knows when to use each.

*4) Orients large scale maps in their proper place on small scale maps.

5) Uses system of parallels to identify relative distance from equator.

6) Tells directions from maps and globes.

a) Knows that North Pole is always to the north and South Pole always to the South.

b) Uses meridians and parallels to identify directions on maps.

7) Uses atlas index and global grid to locate places.

*8) Identifies distortions on map.

*a) Identifies type of map distortion by comparing grid on map with grid on globe.

9) Draws inferences from maps.

a) Draws inferences from a comparison of different map patterns of the same area.

*10) Develops a system of regions to fit a particular purpose.

4. Organizes and analyzes data and draws conclusions.

a. Applies previously-learned concepts and generalizations to new data.

b. Classifies data.

*c. Uses simple statistical device of mean (average) to analyze data but recognizes that it does not reveal range and variation in data.

d. Tests hypotheses against data.

ATTITUDES:

1. Searches for evidence to disprove hypotheses, not just to prove them.

2. Respects evidence even when it contradicts preconceptions.

3. Is sceptical of the finality of knowlege; considers generalizations and theories as tentative, always subject to change in the light of new evidence.

4. Is sceptical of theories of single causation in the social sciences.

5. Is curious about social data.

ABBREVIATED OUTLINE OF UNIT

I. The United States is located in the Western Hemisphere in the middle latitudes.

II. The United States is the fourth largest country in the world.

III. Since maps contain distortions of various kinds /as discovered by students in attempt to measure distances and areas/, they must be used with caution.

IV. One must know something about the site of an area in order to understand what it is like; site characteristics include both physical and man-made features.

A. By applying things we already know, we can make many useful guesses about what places are like as we study maps and pictures; these guesses or hyotheses can be checked against other data, including other maps.

B. Physical features differ widely from one place to another in the United States. Different patterns can be discerned in the distribution of each of the phenomenon.

1. Elevations differ considerably from one part of the country to another. The United States is drained by many rivers which flow from higher elevations to lower elevations.

2. Elevations do not indicate the amount of local relief and landforms; the distribution of these landforms also forms distinctive patterns on the map.

3. Climate varies from one part of the country to another, and the country can be divided up into different climatic types.

4. Vegetation is affected by climate.

5. Soils affect vegetation and the crops which can be grown and in turn are affected by vegetation and crops as well as by the basic rock from which they are formed, by climate, and by wind, water, and glacial action.

V. United States Geography cannot be understood by studying only physical features; we must study the many ways in which man uses and modifies the physical environment.

A. Physical boundaries are drawn by man; frequently they do not coincide with natural boundaries.

B. Men's agricultural activities are affected by but not determined by physical features.

C. Population is not distributed evenly across the Unites States; the eneven population pattern results from many factors. Population is growing, and many shifts are taking place in population patterns.

D. The location of industrial centers is affected by a variety of factors such as location of resources needed for production, location of power sources, transportation routes, access to markets, sources of labor supply, etc.

VI. The United States can be divided into regions for further study.

A. The geographer draws regional boundaries as a means of delimiting an area for the purpose of study; he can identify regions on the basis of different factors, depending upon his purpose.

B. The United States can be divided into regions in a number of different ways, depdnding upon the purposes of the geographer.

VII. The geographer studies what places are like and what makes one place different from another; he uses a number of tools of analysis.

OBJECTIVES	OUTLINE OF CONTENT
	I. The United States is located in the Western Hemisphere in the middle latitudes.
S. Interprets map symbols. G. Things can be located at specific points on the earth's surface. S. Visualizes generalized maps of U.S. and of North America and so is able to identify them on map.	A. Continental United States is located in North America south of Canada and north of Mexico. Two states, Alaska and Hawaii, are located outside of the main boundaries of the country.
G. Places can be located in terms of their situation; situation describes a phenomenon in areal relationship with other phenomena with which it is associated, including distance and direction from such phenomena.	B. The United States can be located in relationship to countries of the world in terms of distance and direction.

TEACHING PROCEDURES	MATERIALS
1. Say: We are going to begin our study of geography this year by studying the United States. We will start by getting a picture of the Unites States as a whole. Give pupils an overview of the unit, telling them something about the topics which they will be studying. Perhaps make a chart listing these topics (or listing major questions related to the topics) and post it on the bulletin board.	
2. Hold up a big globe and ask a pupil to locate the Unites States. Then ask the class: Did he have to read all of the names to locate the United States? Why not? How did he recognize the United States so quickly? Pupils will undoubtedly point out that he knows the shape or knows it is in a certain spot in North America which he recognizes by shape. Point out that the shape is relly a symbol found on a map. Put a word such as horse or dog or cat on the chalkboard. Ask: What do you think of when you see each word? The word is also a symbol standing for a certain thing. How does the symbol for the U.S. differ from a word symbol? What does the shape represent? (If possible show pictures of the U.S. taken from space to illustrate the fact that the symbols of countries are drawn to represent actual shapes of land.) Now have pupils locate the U.S. on a world map.	Large globe. World map. Pictures of U.S. taken from outer space by U.S. aeronauts e.g. Meyer and Strietelmeier, Geography in World Society, p. 674.
3. Now ask, if it has not been brought out already: On what continent is the U.S. located? (Review meaning of continent.) What countries are located next to us? As each is pointed out, ask: In what direction is this country from the U.S.? How do you know? (Review briefly the fact that the north pole is always north and the south pole always south.)	Large globe. World map.

S. Knows cardinal directions.

S. Tells directions from maps and globe.
(Knows that the North Pole is always to the north and South Pole to the south.)

S. Compares distances.

S. Knows cardinal directions.

S. Knows intermediate directions.

G. Things can be located at specific points on the earth's surface, usually designated by an abstract grid and described in terms of latitude and longitude.

S. Uses atlas index and global grid to locate places.

C. The grid of meridians and parallels helps one locate places in terms of exact points on the earth's surface and in terms of direction and distance from other places.

Point out that North American is in the Western Hemisphere. Explain meaning of hemisphere. Then ask: What other places are in the Western Hemisphere besides the ones we have just mentioned? Point out that class will be studying the Western Hemisphere this year.

Ask pupils to locate the two states which are not attached to the main part of the U.S. In what direction are they from the continental U.S.? What are Alaska's nearest neighbors? In what direction are they from Alaska?

4. Now ask children what other countries they have studied in the past or know something about. (Pupils who have come through the Center's curriculum should mention such countries as Japan, Peru, the U.S.S.R., Nigeria, Israel, France, and India.) Have pupils locate these places, noting the direction and comparative distances from the United States or the children's own town on a globe. Ask: How do you know what direction some of these places are from the United States, since none but Peru is due north or south of the United States? (Review cardinal direction and intermediate directions.)

World map. Globe.

5. Now point out that we have located the U.S. in two ways: first by noting the exact place on the face of the earth and second by noting where it is in relationship to some other places in the world. Say: Geographers have made maps for us and have located places for us on globes. However, they had to develop some system to use to locate places on the globe. We have located the U.S. by knowing its shape. Suppose we didn't know its shape. Or suppose we want to locate a place whose shape we don't know. The system worked out by geographers to locate places can help us. How do geographers describe exactly where places are on the earth's surface? Let pupils make some guesses. If they have come through the fourth grade course, they should know that geographers have developed a system of

Globe. Filmstrips: Latitude and Longitude, Educational Audio-Visual, Inc. Latitude, Longitude, and Time, Eye Gate House. Atlas with index which uses longitude and latitude.

S. Uses meridians and parallels to identify directions on maps.

S. Uses parallels to identify relative distance from equator.

G. The rotation of the earth produces day and night, while the inclination of the earth and its revolution around the sun results in seasons and differences in temperature on the earth's surface.

G. Temperature and seasonal differences are affected in part by distance from the equator; temperature ranges are smaller nearer the equator than further away from it.

D. Continental United States is located in the middle latitudes, although Alaska is located in the high latitudes.

meridians and parallels which help us locate places. If not, t time at this point to use some of the activities from the unit Trobriand Islanders in grade four to teach children the uses of and the characteristics of the global grid. Or show filmstrip which describes the grid. Then show pupils an atlas index whic uses the global grid. Give pupils a dittoed exercise in which they are given the location of five or six places in terms of t longitude and latitude and asked to locate places on a map.

6. Make sure that pupils understand the ways in which the global grid can be used to determine directions on the globe or a map. Give them an exercise in identifying directions on a map which shows parallels as curved lines. (e.g. Show two places, A & B, on the same line of latitude, but with one closer to the top of the map than the other. Ask: In what direction is A from B?)

7. Make sure that pupils understand the way in which the global gr can be used to determine distances north and south of the equat Ask: What difference does it make whether or not a place is cl to the equator or not? Review what pupils learned in earlier grades about the effects of the rotation of the earth and the r volution of the earth around the sun upon day and night, season and temperature. If pupils have not studied the Center's earli courses which have demonstrated these relationships, use one of the activities (such as in the Kindergarten unit on Our Global Earth) or show one of the films or filmstrips which demonstrate the relationships and their effects.

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Dittoed map.

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these relationships, use one of
indergarten unit on Our Global
or filmstrips which demonstrates
cts.

Globe and light.
Filmstrip: Day and Night, Educational Audio-Visual Inc.
Film: What Causes the Seasons, MicGraw Hill, 12 min.
Film: Causes of The Seasons, 16 min., Coronet.

S. Sets up hypotheses.

S. Compares areas.

G. Maps contain distortions of one kind or another.

S. Identifies distortions on maps.

II. The United States is the fourth largest country in the world.

A. China, the U.S.S.R., and Canada all exceed it in size.

8. Point out the 30th parallels north and south of the equator and explain that the areas falling between these two parallels are known as the low latitudes; they are close to the equator. Then point out the 60th parallels and the areas which fall between the thirtieth and sixtieth parallels and tell the class that these areas are known as the middle latitudes. Then point out the sixtieth parallels and explain that the area between these parallels and the poles are known as the high latitudes. Now ask: In which of these latitudes does the U.S. fall? does Alaska fall? What guesses can you make about the United States and about Alaska by knowing this information?

World map.

9. Say: We've been looking at the location of the United States in relationship to other places, and we couldn't help but notice something about the size of the U.S. as compared to some other countries. What is your general impression about its size? Where do you think it might rank in size? Let's check our guesses now by comparing its area and distances across it with those in other countries.

   If possible, pass out a number of small globes to groups of children. If not, use a large globe in the front of the class. Ask several children to come up and compare the size of the U.S. with a number of other countries, including the U.S.S.R., China, Canada, France, and India. Or have a committee make tracings from a small globe on pieces of acetate to show outlines of these countries. (They should make these tracings as accurate as possible even if they cannot be completely accurate.) They should then outline the countries with different colored inks and project them as overlays with an overhead projector. Have another group of pupils make tracings of the same countries from a Mercator projection and make overlays of them. Compare the two sets. For example, compare Canada and the U.S. on both the Mercator map and the globe. What difference do children note? Do the same thing with other tracings. Children will note that the Mercator map exaggerates sizes of countries further from the equator.

Small globes or one large globe. Mercator map. Acetate. Overhead projector.

S. Compares distances.

S. Identifies distortions on maps.

B. It is approximately 3,000 miles across the United States in an east-west direction and 1,500 miles in a north-south direction.

S. Uses map scale to estimate distances.

S. Identifies distortions on maps.

G. All maps contain distortions of one kind or another.

III. Since maps contain distortions of various kinds, they must be used with caution.

(This section is optional. It might be used in

10. Now have several pupils prepare charts of comparative distances on a Mercator map and on a globe. For example, one pupil might prepare a chart comparing the north-south distances of the U.S. and of Canada as shown on a Mercator projection. Another might do the same for the distances as shown on the globe. A third pupil might make a chart showing the comparative north-south distances in the United States and the Soviet Union as shown on a Mercator map. A fourth pupil could make a similar chart to show these distances as shown on a globe. Still other pupils could compare east-west distances at the northernmost points in Canada, the U.S. and the U.S.S.R. Compare each pair of charts (made from the globe and from the Mercator map). What differences do pupils note? Let pupils think of possible reasons for these differences which they can check shortly. Look once more at the charts made from the globe. How does the U.S. compare with Canada in terms of distances north-south and east-west? How does it compare with the U.S.S.R. in terms of these distances?

Globe.
Mercator map.
Chart paper.

11. Have pupils look at a map of the U.S. Ask: How can we tell how many miles it is across the country from one coast to the other? Review the use of the scale and have pupils make themselves map rulers and each figure out the east-west and north-south distances across the country. Now have them do the same thing for a map of Canada and for some other country in which they are interested.

Map of U.S.
Map of Canada

As indicated in the outline content, the following section of activities (to teach part III of the unit) may be omitted in entirety.

12. Say: We have found that the Mercator map distorts distances and areas. Lets look at some other examples of distortions and ways in which the Mercator map and other maps can be misleading. Show pupils two charts, one comparing Greenland and South America as

Charts showing distortion on Mercator map.

A. RESPECTS EVIDENCE EVEN WHEN IT CONTRADICTS PRECONCEPTIONS.

average and above average classes. Teachers who wish to use many kinds of map projections should find it useful.)

A. All maps are distorted, since it is impossible to represent a round surface accurately on a flat map.

shown on a globe and one comparing them as shown on a Mercator map. What difference is there?

13. Say: Suppose you wanted to go by the shortest route from Seatt (point to on Mercator map) to Moscow. What direction would you go? Would Moscow be farther or closer than Peking? (point to on map) Place pupils' answers on board. Now have several pupi come to the front of the room and use the globe. Ask them the same questions and put their answers on the board. What differ are there in the two sets of answers? Why don't they agree? N show the class an azimuthal map centered on the north pole. Ha pupils compare the two maps. What differences do they see? Wh shows the air distance between the U.S. and U.S.S.R. the better What disadvantages do pupils see in the polar map? Let pupils up some possible disadvantages at this point which they can che later.

14. Ask: Why are these maps so distorted? Pupils may have some id If not, take a rubber ball and use a magic marker to draw on th equator where the two parts are fastened together and the nort and south poles. Then cut the ball in half at the equator and let several pupils try to flatten it out on a sheet of paper. Finally, cut a number of slits at the two poles so that it will lie flat. Now trace its outline on a piece of acetate. Projec the acetate and ask pupils what would have to be done to make a connected map without the slits. (The pieces would have to be stretched to meet each other.) Show pupils a map which illustr what such a map would look like if the areas toward the poles w only stretched in an east-west direction. What happens to the shape of continents? How could the shape be made more like the actual shape? (Stretch north and south too.)

as shown on a Mercator

ortest route from Seattle
nat direction would you
han Peking? (point to
Now have several pupils
e globe. Ask them the
the board. What differences
hy don't they agree? Now
on the north pole. Have
rences do they see? Which
and U.S.S.R. the better?
polar map? Let pupils set
oint which they can check

Mercator map.
Globe.
A zimuthal map centered on North Pole.

Pupils may have some idea.
ic marker to draw on the
d together and the north
alf at the equator and
on a sheet of paper.
o poles so that it will
ece of acetate. Project
ve to be done to make a
ieces would have to be
ils a map which illustrates
reas toward the poles were
. What happens to the
e be made more like the
too.)

Hollow rubber ball.
Magic marker.
Knife.
Acetate.
Overhead projector.

G. All maps contain distortions of one kind or another; each kind of map projection has both advantages and disadvantages, depending upon one's purpose in using a map.

S. Identifies distortions on maps.

S. Identifies type of map distortion by comparing grid on map with grid on globe.

G. All maps contain distortions of one kind or another; each kind of map projection has both advantages and disadvantages, depending upon one's purpose in using a map.

B. Different kinds of
for different purp
ferent kinds of di
uses.

1. One can identif
on a map by com
grid on a globe

2. Although all ma
maps of countri
are not distort
the world.

ortions of
each kind
both ad-
tages, de-
rpose in

s on maps.

o distor-
d on map

ortions of
each kind
both ad-
tages, de-
rpose in

B. Different kinds of maps have been developed for different purposes; each contains different kinds of distortions but has specific uses.

1. One can identify the type of distortion on a map by comparing its grid with the grid on a globe.

2. Although all maps are distorted somewhat, maps of countries or individual continents are not distorted so badly as are maps of the world.

15. Have pupils look at the Mercator map and see if they c any indication that this is, in effect, what has been pupils do not notice it immediately, ask: What happen distance between the parallels as they get closer to t Does the same thing happen on the globe? How can you the Mercator map that the northern and southern parts have been stretched in an east-west direction? (Compa happens to meridians on map and on globe.) Then ask: map is so distorted, does it have any advantages that (Ask additional questions to help pupils see that shap masses are fairly accurate and that the grid can be u tect distortions.)

16. Point out that pupils can detect distortion on any map ing the grid on the map with the grid on the globe. H identify once more the major features of the global gr on a large chart which can be mounted in the room. No pupils several kinds of maps, including an equal-area type, an azimuthal map centered on the north pole, an map which looks as though a picture had been taken of from a distance, and a map of the U.S. Make a chart o to show how the grid features compare with those of th Hang opposite the chart on the global grid. (Have pup the map grid feature by feature and figure out what th in the globe grid mean in terms of such things as size and distance and shape.) Then ask: What possible adv are there to each of these maps? (Be sure to have chi pare the amount of distortion on world maps as compare map of the U.S.)

17. Ask: Which of these types of maps would you use if yo compare sizes of different countries? What should you want to measure distances between the U.S. and other p you use a map of the United States to measure distance tify directions? Why or why not?

ercator map and see if they can find
is, in effect, what has been done. If
mmediately, ask: What happens to the
llels as they get closer to the equator?
n on the globe? How can you tell from
northern and southern parts of the map
east-west direction? (Compare what
ap and on globe.) Then ask: Since this
it have any advantages that you can see?
to help pupils see that shapes of land
e and that the grid can be used to de-

Mercator map.
Globe

detect distortion on any map by compar-
ith the grid on the globe. Have pupils
jor features of the global grid. Place
n be mounted in the room. Now show
aps, including an equal-area map of some
ntered on the north pole, an orthographic
a picture had been taken of the earth
of the U.S. Make a chart on each map
ires compare with those of the globe.
n the global grid. (Have pupils compare
ature and figure out what the changes
terms of such things as size of area
Then ask: What possible advantages
maps? (Be sure to have children com-
ion on world maps as compared to the

Globe
Chart paper
Equal-area maps
of World.
Azimuthal map
centered on North
Pole.
Orthographic map.
Map of U.S.

of maps would you use if you wanted to
countries? What should you do when you
between the U.S. and other places? Can
d States to measure distances and iden-
why not?

S. Sets up hypotheses.

IV. One must kn
in order to
acteristics
features.

A. By apply
can make
are like
guesses
other da

G. Places can be located in terms of site which relates a phenomenon to the detailed physical setting of the area it occupies.

IV. One must know something about the site of an area in order to understand what it is like; site characteristics include both physical and man-made features.

A. By applying things that we already know, we can make many useful guesses about what places are like as we study maps and pictures; these guesses or hypotheses can be checked against other data, including other maps.

18. Now use a filmstrip or film to review distortions on different kinds of maps.

19. Introduce the next section of the unit by saying: We have now located the United States in terms of its specific position on the earth's surface and in terms of its situation or its relationship to other places. Locating places in terms of its position and situation permit us to make certain guesses about what places are like or about how people in an area live. What kinds of guesses did we decide we could make because of the position in terms of distance from the equator? (Review possibilities of guessing something about temperature and seasons.) What kinds of guesses might we make by knowing where places are in terms of other countries or places? (Let pupils make guesses about possible effects of the closeness of the U.S. to Canada and Mexico, about the situation of the U.S. in relationship to the Panama Canal, about the fact that the shortest distance between the U.S. and the U.S.S.R. is across the Polar regions. Point out that the class will check these guesses as they continue their studies. World map.

    Say: We have also looked at the size of the United States. Of what importance might the size be? Let pupils make guesses or hypotheses. Record them for checking during the course of the unit on the U.S.

20. Say: Usually, we want to know much more about a place than just what we can tell from its position, situation, or size. Suppose you were thinking of making a trip to Seattle. (Point out on map.) What would you want to know about it before you decided to go there for a visit? What would you want to know about Seattle before you would decide whether or not to move there to live? What Map of U.S.

G. Some things can be produced better in one place than in another because of climate, resources, transportation routes, access to resources, access to markets, people's skills, etc.

G. Geographers ask different questions about places, depending upon their purposes at the moment.

S. Sets up hypotheses.

A. IS CURIOUS ABOUT SOCIAL DATA.

would you want to know if you were a manufacturer and were considering putting up a factory there? Why do the things you want to know differ in each situation?

Say: Geographers, too, may differ in the kinds of questions they ask about different places, depending upon their purposes. However, most of them want to know something about the site. That is, they want to know what physical features are found there and what man-made features are found there. They also want to know how people live there. In general, they are trying to find out why this place differs from others and how it is related to others. We have learned that we can make a number of guesses about places by knowing their size or their position and situation in relationship to other places. There are other ways in which we can make guesses too.

21. Say: You are now going to read a brief selection called "Making Geography Guesses." I am going to give you just the first section at this time. At the end of this section, the author asks you to examine a map and make your own guesses. Look at the map which I have posted and then list your guesses on a sheet of paper.

"Making Geography Guesses" (see Appendix.)
Map of state of Washington.

Give pupils time to read and to make their lists. Then discuss their guesses. Make a composite class list of hypotheses and discuss their tentative nature. This should be easy, as probably pupils will suggest some contradictory hypotheses. At this stage, do not identify guesses toostrongly with individual pupils. Be sure to accept all of the guesses, even the contradictory ones, as hypotheses for further examination. It is essential that none of these ideas be ridiculed even if they are slightly or highly bizarre. The main purpose of the exercise is to get a rough estimate of the group's ability to interpret maps and to set the stage for the year's work by encouraging pupils to set up hypotheses of their own for testing.

Now give pupils the rest of the selection on "Making Geography Guesses" and have them complete the reading.

S. Sets up hypotheses.

S. Gains information by studying pictures.

S. Draws inferences from maps.

S. Tests hypotheses against data.

A. IS CURIOUS ABOUT SOCIAL DATA.

Understands concept of elevation.

B. Physical features diff
place to another in th
ferent patterns can be
tribution of each of t

1. Elevations differ o
part of the country
States is drained b
from higher elevati

q pictures.

p.

B. Physical features differ widely from one place to another in the United States. Different patterns can be discerned in the distribution of each of the phenomenon.

1. Elevations differ considerably from one part of the country to another. The United States is drained by many rivers which flow from higher elevations to lower elevations.

22. Present geographic data to the class and have them develop "guesses" to explain what they see. For example, they mig simply look at a map of any large area in the world and tr to explain why a large city(such as London) is located whe it is. Be certain to ask as well what it would take to pr the hypotheses (guesses) true or false. Project slide or the class a picture of some place other than one of the pl to be studied in detail during the year and have pupils li all of the things they think might be true about the place (Perhaps divide class into groups for this activity.) The class where the place is and let pupils read to check on t guesses.

23. Remind the class that they will now look at characteristic the United States as a whole before they study individual of the country. This will help them see the big picture a where and how the various parts fit together. They will b maps and pictures and other kinds of data and will make an many guesses.

24. Review the meaning of elevation. If pupils have not studi Center's primary grade courses, you may wish to use an act similar to that used in the Quechua unit (grade one) or do such activity as the following to teach pupils the meaning concept.

    Draw a cross-section diagram showing sea level, low coasta a hilly area, a higher plateau region, mountains, and a hi teau on the other side of the mountains. Make the diagram large sheet of paper. Then draw parallel lines across the beginning at sea level and at half inch intervals to the t the highest mountain peak. Say: Suppose each of these ha represents 100 feet. Let's start at sea level and measure height of the places in the diagram above sea level. Is e place more rugged than that which is lower? If we say tha

the class and have them develop hey see. For example, they might large area in the world and try (such as London) is located where s well what it would take to prove ue or false. Project slide or show place other than one of the places ing the year and have pupils list k might be true about the place. groups for this activity.) Then tell d let pupils read to check on their	Map of England. Slide or picture of some area; should contain rather obvious de- tails for use in hypothesizing.
will now look at characteristics of e before they study individual parts help them see the big picture and arts fit together. They will be using kinds of data and will make and test	
tion. If pupils have not studied the ses, you may wish to use an activity Quechua unit (grade one) or do some ing to teach pupils the meaning of the	Teacher-made cross-sectional diagrom.
m showing sea level, low coastal plains, eau region, mountains, and a high pla- he mountains. Make the diagram on a draw parallel lines across the diagram, at half inch intervals to the top of Say: Suppose each of these half inches start at sea level and measure the diagram above sea level. Is each higher which is lower? If we say that this	

S. Applies previously-learned concepts and generalizations to new data.

G. Rivers flow from higher elevations to lower elevations.

S. Sets up hypotheses.

A. SEARCHES FOR EVIDENCE TO DISPROVE HYPOTHESES, NOT JUST TO PROVE THEM.

S. Tests hypotheses against data.

S. Interprets map symbols (color layers) in terms of legend.

G. Unevenly distributed phenomena form distinctive patterns on the map.

G. Maps make it possible to discern patterns and relationships among a vast amount of data.

S. Interprets map symbols (color layers) in terms of map legend.

place (point it out) has an elevation of 1000 feet, what do we mean? If we say that this place (point to the mountain peak) has an elevation of 4000 feet, what do we mean, etc.?

25. Show pupils a map of the U.S. which indicates only the river systems and major lakes, not elevations or landforms. Ask: Given what you already know about rivers, where do you think the higher lands would be? Where do you think the lower lands would be? Let pupils use outline maps to draw in their guesses.

26. To enable pupils to check their hypotheses, show them an elevation map of the United States which indicates elevation by the use of color layers (and no shading or hachures or raised relief). Review the use of color layers, or if pupils have not had the Center's earlier courses, teach them the meaning at this time. Be sure to check their understanding by asking: What does the green on the map mean? What does the dark brown mean? Ask a pupil to point out the key and read aloud the meaning for the different colors. Note differences in elevation around the country. Check the pupils' hypotheses (made in activity 25), eliminating those which are incorrect and modifying others. What general statements can pupils make about the "pattern" of elevation which they see? Now show pupils a table which presents data on elevations for a number of cities in this country. Does the table or the map make it easier for them to understand the elevation <u>pattern</u>? Why?

27. Use the same map and ask: Can you tell from this map what the land looks like? (Can you tell where the hills and flat places are? Can you tell what areas have grass and trees?) Perhaps project some pictures or slides of areas which have the same

on of 1000 feet, what do we
point to the mountain peak)
do we mean, etc.?

n indicates only the river sys-
ns or landforms. Ask: Given
, where do you think the higher
k the lower lands would be?
d in their guesses.

Outline map of U.S. showing only Rivers, Lakes, and perhaps state boundaries. Set of desk outline maps of U.S.

potheses, show them an eleva-
n indicates elevation by the
g or hachures or raised re-
yers, or if pupils have not
teach them the meaning at this
rstanding by asking: What does
does the dark brown mean? Ask
read aloud the meaning for the
s in elevation around the coun-
(made in activity 25), elim-
and modifying others. What
about the "pattern" of eleva-
ills a table which presents data
es in this country. Does the
or them to understand the ele-

Physical map of U.S. showing elevation by use of color layers.

List of elevations of a No. of cities in U.S.

you tell from this map what the
where the hills and flat places
e grass and trees?) Perhaps
of areas which have the same

Same map as for 26.

A. RESPECTS EVIDENCE EVEN WHEN IT CONTRADICTS PRECONCEPTIONS.

S. Interprets map symbols (color gradients and shading).

Understands site concepts related to landforms (e.g. plains, plateaus, hills, mountains).

S. Applies previously-learned concepts and generalizations to new data.

S. Gains information by studying pictures.

Understands site concepts related to landforms (e.g. plains, plateaus, hills, mountains).

2. Elevations do not indicate the amount of local relief and landforms; the distribution of these landforms also forms distinctive patterns on the map.

   a. The major types of landforms consist of plains, hills, mountains, and plateaus.

color on the map but which have very different surface relie
and vegetation in order to help pupils understand the need
read a map in terms of the map legend.

28. Now show pupils a physical relief map which uses color grad
and shading. Why don't the map makers have sharp changes i
color from one color to another? Why do they have them merg
into each other? Review meaning of hills, mountains, plains
and plateaus. Have pupils locate examples of each on a phys
terms relief model and then on a raised relief map of the U

29. If pupils have not studied the Center's primary grade course
or if the review session indicates that they do not really
know much about the different knids of landforms, you may w
to use several activities such as the following:

    a. Show pictures of different physical features and loc
    on the map. Or mount a map on the bulletin board w
    pictures around it, each attached by a string to the
    proper location.

    b. Or prepare a bulletin board display entitled "Where
    the World Have You Been?" Mount a map of the world
    on the bulletin board and let pupils bring pictures
    places where they have been to mount around the map.
    Connect pictures to appropriate places on map with s
    and pins, and have pupils prepare title cards for ea
    picture to indicate landforms shown in picture.

ve very different surface relief
lp pupils understand the need to
p legend.

lief map which uses color gradients
ap makers have sharp changes in
er? Why do they have them merge
ing of hills, mountains, plains,
cate examples of each on a physical
n a raised relief map of the U.S.

Physical map of U.S. which uses color gradients and shading. (e.g. Borchert and McGuigan, Geography of the New World, pp. 6-7.
A physical terms relief model.
Raised relief map of U.S.

e Center's primary grade courses,
cates that they do not really
knids of landforms, you may wish
h as the following:

erent physical features and locate
a map on the bulletin board with
ach attached by a string to the

Map of the U.S.
Pictures of landforms.
String and pins.

board display entitled "Where in
en?" Mount a map of the world
and let pupils bring pictures of
e been to mount around the map.
ppropriate places on map with string
pils prepare title cards for each
andforms shown in picture.

Map of world.
String and pins.

Understands concepts of valley and gorge.	1) Mountains and plateaus may be cut by deep valleys and gorges.

c. Prepare sets of slides or collect Viewmaster reels showing some of the concepts such as mountains, plains, plateaus, hills, etc. which you wish pupils to learn to understand. Select slides to illustrate the differences which exist within the concept classification as well as the aspects which all of the members of this class have in common. (e.g. Show different types of plains areas or different types of mountains. Include examples of same landform in several climates or vegetation regions so as not to develop stereotypes.) Place a viewer or a projector with a small screen on a table in the room and let pupils select the slide cartridges they need to view. Or ask those who need remedial work to examine a specific set of slides.	Slides of landforms.
d. Prepare a bulletin board display entitled "What is a Mountain?" Use cross sectional diagrams and pictures on the board. Under the display, place a table with a relief model of a mountainous area. Perhaps have a three dimensional viewer with scenes of different mountain areas which pupils can view individually. Or use one of the newer small screens and projectors which pupils can operate to view different slides about mountains.	Diagram and pictures of mountains. Relief model of mountainous area. Viewmaster and mountain slides.
e. Use some of the commercially prepared charts showing land-forms and map symbols which represent them.	e.g. Nystrom's Map Symbols and Geographic Terms Charts.
f. Show pictures of deep valleys and gorges cut through mountains and plains. Show also on concepts model.	Pictures of valleys and gorges. Concepts model (e.g. Nystrom Geographical Terms Model).

Understands concept of mesa and butte.

2) Mesas an
on high

Understands site concepts related to landforms (e.g. plains, plateaus, hills, mountains, valleys, gorge, mesa, butte)

G. Unevenly distributed phenomena form distinctive patterns on the map.

b. Landforms f
the map.

2) Mesas and buttes are frequently found on high plateaus.

b. Landforms form distinctive patterns on the map.

g. Now show pictures of mesas and buttes and explain meaning of these terms. (The concept of mesa should be review for pupils who have come through the Center's first grade course.)

h. Evaluate pupils' knowledge of different kinds of landforms by projecting a series of slides which you can number orally. Have each pupil write the type of landform after each number on a sheet of paper. Or mount pictures and number them and place them on a bulletin board. Give pupils sheets of paper on which they can write the name of the landform shown in each picture. You may also wish to build your own model to show a number of different landforms. Paint in a number on each and ask pupils to identify them on a sheet of paper.

30. Show pupils a relief map once more (preferably a raised relief map). Ask: What generalized pattern of landforms do you see on the map? (e.g. Where are the mountains? Are the Rockies or the Appalachian mountains the higher? Where are the plains? Where are the high plateaus? Where are the hilly regions?) Perhaps have pupils contrast pictures of Appalachian Mountains and Rocky mountains.

s of mesas and buttes and explain mean- ms. (The concept of mesa should be re- who have come through the Center's first	Pictures of mesas and buttes, (e.g. See Nystrom Map Symbols and Geographic Terms Charts.)
knowledge of different kinds of landforms series of slides which you can number oral- upil write the type of landform after each t of paper. Or mount pictures and number hem on a bulletin board. Give pupils on which they can write the name of the n each picture. You may also wish to build o show a number of different landforms. r on each and ask pupils to identify them per.	Slides or pictures of different landforms. Model of landforms without concepts identified.
once more (preferably a raised relief lized pattern of landforms do you see on re the mountains? Are the Rockies or the e higher? Where are the plains? Where Where are the hilly regions?) Perhaps tures of Appalachian Mountains and Rocky	Relief map of U.S. or system transparencies on Major Land Forms. For pictures of Appalachian mountains, see plates 12 of Informative Classroom Pictures set on The South. For pictures of Rockies see old National Geographics; books and pamphlets on some of National Parks. (e.g. U.S. Dept. of Interior, Natural Resources

G. Nature changes the face of the earth through physical processes.

S. Sets up hypotheses.

S. Tests hypotheses against data.

S. Sets up hypotheses.

G. A river which moves rapidly carries with it much sediment and frequently cuts deep valleys.

the
cesses.

ata.

c. Landforms have been created by a variety of natural physical forces.

d. Rivers which flow swiftly look quite different from slowly moving rivers and have very different effects upon the areas through which they flow.

nt
lleys.

31. Although pupils have probably studied many of these la
earlier grades, they probably have not learned much ab
reasons for differences in landforms. At this point y
ask: Why do you think there are these differences in
in different parts of the country? Let pupils make gu
then show them the filmstrip Story of a Mountain. Som
might also enjoy doing some of the following activitie

a. Preparing an oral report on the sudden emergence of
near Iceland.

b. Reading the book All About the Ice Age to learn mor
the effects of glaciers.

c. Examining sets of slides or pictures of the Badland
ing about the way in which they were created.

d. Reading the pages in The World We Live In on how d
land forms are created.

32. Some of the analysis of how mountains are made and ar
illustrate some of the effects of rivers. Now remind
they were able to tell a good deal about elevation pa
country by examining a map of river systems. Say: L
we do know about rivers. (Review such facts as that

	of Colorado); Life, May 29, 1964, pp. 48ff.
udied many of these landforms in ve not learned much about the orms. At this point you might these differences in landforms y? Let pupils make guesses and ry of a Mountain. Some pupils he following activities:	Filmstrip: Story of a Mountain, E.B.F.
he sudden emergence of an island	Thorarinsson, "Surtsey: Island Born of Fire," National Geographic, May, 1965, pp. 713-726.
e Ice Age to learn more about	Lauber, All About the Ice Age.
ictures of the Badlands and read- ey were created.	National Park Service, Badlands National Monument (booklet)
d We Live In on how different	Life Editorial Staff, The World We Live In, pp. 42-62.
tains are made and are shaped will f rivers. Now remind pupils that al about elevation patterns in the ver systems. Say: Let's see what w such facts as that they flow	Nystrom Map Symbols and Geographic Terms Charts. Map of Mississippi delta on p. 248

G. A river which moves slowly across a plain drops gravel and sand that it has moved from higher areas.

S. Differentiates between small scale and large scale maps and knows when to use each.

e. Landforms can be seen more easily on large-scale maps than on small-scale maps; however, small-scale maps show situation better.

from higher elevations to lower elevations, that rivers which flow rapidly cut deep valleys or gorges and carry off much silt, etc.) Pupils may not know much about slowly-moving rivers. You may wish to show them pictures and maps showing ox-bow rivers, and deltas such as at New Orleans. Ask: Why do you think the Mississippi (or whatever river is shown) splits up like this? Why doesn't it develop just one big channel? Why do you think the river twists and turns like this? Why doesn't it cut through at these places (point to places on map or picture) and straighten itself out more? Perhaps call attention of pupils to elevation and land forms in region and ask: Do you think the river would be flowing swiftly or slowly here? Why? You may also wish to demonstrate the way in which slowly moving water drops silt by very slowly pouring extremely muddy water into one end of a sink and noting the residue which remains after the water has gone down the drain.

33. Look at a large wall raised relief map of the U.S. Have pupils locate hills and mountain peaks. Ask: Do you think this map shows every hill in the country (or in our state)? Do you think it shows every mountain peak? Why not? Have pupils look at the Mississippi River. Ask: From what you have seen of rivers do you think the river really is as straight as it looks on this map? Show a picture of the Mississippi which shows it twisting and turning at a spot which looks straight on the map. Ask: Why doesn't the map show these curves in the river? Ask children to look at the outline of Lake Superior. Ask: From what you have seen of lakes, do you think the lakeshore is really as smooth as this? Show pictures of points and inlets in the lake and ask why the map does not show all of them. Pupils will probably quickly point out that the map is too small to show small details such as these. Ask: What would we have to do if we wanted to make a map to show such details? (Use a larger scale). (Perhaps review the way in which pupils drew their own maps to different scales in earlier grades.) Now show pupils large scale maps, preferably of the same place on the river or the same place on Lake Superior where the pictures were taken.. Or use the series of three maps

to lower elevations, that rivers which
alleys or gorges and carry off much silt,
now much about slowly-moving rivers. You
ictures and maps showing ox-bow rivers,
ew Orleans. Ask: Why do you think the
r river is shown) splits up like this?
just one big channel? Why do you think
rns like this? Why doesn't it cut through
to places on map or picture) and straighten
os call attention of pupils to elevation
n and ask: Do you think the river would be
ly here? Why? You may also wish to demon-
slowly moving water drops silt by very
y muddy water into one end of a sink and
h remains after the water has gone down

and picture of curve in Missouri River on p. 254 of Finch et. al. Earth and Its Resources.

ised relief map of the U.S. Have pupils
in peaks. Ask: Do you think this map
country (or in our state)? Do you think
peak? Why not? Have pupils look at the
: From what you have seen of rivers do
lly is as straight as it looks on this map?
issippi which shows it twisting and
looks straight on the map. Ask: Why
ese curves in the river? Ask children to
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points and inlets in the lake and ask why
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d we have to do if we wanted to make a map
(Use a larger scale). (Perhaps review the
w their own maps to different scales in
how pupils large scale maps, preferably of
iver or the same place on Lake Superior
taken. Or use the series of three maps

Raised relief map of U.S.
Pictures of curves in upper Mississippi and Lake Superior Shoreline.
Large-scale maps showing areas in pictures.
Kohn and Drummond, The World Today, pp. 40-41.

S. Orients large-scale maps in their proper place on small-scale maps.

S. Uses map scale to estimate distances.

S. Interprets map symbols (contour lines).

S. Interprets maps symbols (contour lines).

of different scale showing New York and Manhattan Island i
and Drummond.

Ask: If large-scale maps show so much more detail, why do
ever use maps of smaller scale such as this? (Point to t
of the U.S. or to the map of smallest scale of New York vi
Discuss the advantages and disadvantages of maps of small
large scale.

34. Show pupils a topographical quadrangle or a topographical sh
a larger area -- perhaps one of the raised relief models p
by the Aero Company. Ask: How can you find out where thi
scale map fits in terms of the small-scale map of the Unit
States? If necessary, ask further questions to help pupil
that they can orient the map in its place on the U.S. map
the lines indicating longitude and latitude on each.

35. Ask: Where can you find out what the scale is that is use
map? Have children locate the scale on a number of maps.
children a series of exercises in measuring distances usin
ferent types of scales.

36. Show pupils the topographic map once more. Point out the
contour lines on it, without calling them by name. Ask wh
think these lines may show. Perhaps have some child look
similar lines on a raised relief model of a quadrangle and
to decide what they represent. Then tell pupils that thes
are known as contour lines and that they can be used to sh
face relief in much more detail than can be shown on small
maps. Use one or more activities such as the following to
pupils how to read contour lines.

a. Set up small groups of pupils. Have each group make a
of a hill or mountain out of modelling clay. Urge pupi
make rather elaborate models with valleys, gently slopi

ing New York and Manhattan Island in Kohn

os show so much more detail, why do we
er scale such as this? (Point to the map
ap of smallest scale of New York vicinity.)
nd disadvantages of maps of small and

ical quadrangle or a topographical sheet of
s one of the raised relief models prepared
sk: How can you find out where this large-
of the small-scale map of the United
sk further questions to help pupils see
e map in its place on the U.S. map by using
ngitude and latitude on each.

U.S.G.S. topographical sheets.
U.S.G.S. raised relief quadrangles prepared by the Aero Co. (Available from Nystrom.)

out what the scale is that is used on a
ate the scale on a number of maps. Give
ercises in measuring distances using dif-

phic map once more. Point out the many
hout calling them by name. Ask what they
ow. Perhaps have some child look for
d relief model of a quadrangle and try
resent. Then tell pupils that these lines
nes and that they can be used to show sur-
e detail than can be shown on small-scale
ctivities such as the following to teach
our lines.

U.S.G.S. topographical sheets or raised relief quadrangles prepared by the Aero Co. (Available from Nystrom.)

f pupils. Have each group make a model
out of modelling clay. Urge pupils to
e models with valleys, gently sloping land

Modelling clay; knife; paper.

S. Gains information by using models.

in some places and steep slopes in others. Then have
ber of the group slice the model along these lines an
them. Others can trace the outlines of the pieces on
of paper to form a contour map of the model. (Pupils
ure out where to place each new outline by fitting the
together again and measuring the distances from the ou
of the last contour line to the place where the next s
fits.)

Now have pupils fit their models together again and no
what happens to the contour lines where the models sho
hills and where they show more gradual hills. What ha
where they have built a valley into the model? etc. C
the models and the contour maps.

b. Give pupils a contour map of an imaginary island and h
them build a model of the island by tracing the lines
sheets of corrugated cardboard, tracing both the line
is to be cut and the next inner line where the next sheet
cardboard should be placed. Glue the sheets of cardbo
together at the appropriate places. Afterwards, pupi
cover the cardboard with a thin coat of clay which can
painted. Or the models can be left without such a cov

c. Prepare a model out of plastic or clay which hardens a
not be affected by water. Place it in a pan of water
is higher than the model. Fasten a ruler to the inside
of the pan. Then pour in a half inch of water and hav
draw a line on the model along the water line. Pour i
half inch of water and draw the next line, and so on.
wards, pupils should be able to see fairly clearly how
connect points of equal elevation.

d. Use Hubbard's transparent contour relief model to demo
contour lines and teach pupils to read them.

ep slopes in others. Then have one mem-
the model along these lines and number
e the outlines of the pieces on a sheet
tour map of the model. (Pupils can fig-
each new outline by fitting the model
suring the distances from the outer edge
ne to the place where the next section

eir models together again and notice
ntour lines where the models show steep
how more gradual hills. What happens
a valley into the model? etc. Compare
tour maps.

map of an imaginary island and have
the island by tracing the lines on
ardboard, tracing both the line which
inner line where the next sheet of
aced. Glue the sheets of cardboard
riate places. Afterwards, pupils could
th a thin coat of clay which can be
s can be left without such a cover.

Dittoed contour map of imaginary island:
Corrugated cardboard
Scissors

plastic or clay which hardens and will
er. Place it in a pan of water which
el. Fasten a ruler to the inside edge
in a half inch of water and have pupils
el along the water line. Pour in another
draw the next line, and so on. After-
e able to see fairly clearly how the lines
l elevation.

Model of clay or plastic
Ruler
Tall can or pan.

ent contour relief model to demonstrate
h pupils to read them.

Transparent Contour Relief Model (Hubbard Scientific Co.)

S. Differentiates between small scale and large scale maps and knows when to use each.

S. Interprets map symbols (contour lines).

S. Interprets map symbols (color layers).

S. Applies previously-learned concepts and generalizations to new data.

3. Clima
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3. Climate varies from one part of the country to another, and the country can be divided into different climatic types.

37. Show pupils a topographic sheet again and have them notice specific landforms in the area shown. Have them compare what they see in this map with what they see in the same place on the small-scale map of the U.S.

38. Give pupils exercises in reading simple contour maps. Questio might be aimed at finding out if they can figure out elevation steepness of slope, where valleys are, etc. Pupils could also use the map scale to figure out the area covered by the hill o mountain. (Perhaps use Hubbard's transparent contour relief model kit to build map for exercise. Build a cardboard model of the map to use in helping pupils check their answers.

39. Now show pupils a color layer elevation map once more to illus trate how the boundary lines between colors are really contour lines but lines in which the intervals are much larger than on topographic maps (thousands of feet rather than ten or fifty o a hundred feet.)

40. Say: These physical characteristics of site which we have just studied are not the only ones of importance in finding out wha places are like. For example, look at the physical map of Min nesota. Can you see any reason why many Minnesotans leave the state to live elsewhere--say in California? Why might some people want to leave the state? Would you ever like to leave in the winter time? Where would you like to go during winter? Why? Tell pupils that many go to California, Florida, and Ari zona--some just for winter vacations and some to live perma nently. Why might they go there? Also point out that some re turn because they decide they prefer Minnesota climate. (Adju this activity to fit the state in which pupils live.)

Now ask: Why might the U.S. have many different kinds of clim

ic sheet again and have them notice he area shown. Have them compare what th what they see in the same place on the U.S.	U.S.G.S. topographic sheet and relief map of U.S.
n reading simple contour maps. Questions ng out if they can figure out elevations, re valleys are, etc. Pupils could also gure out the area covered by the hill or Hubbard's transparent contour relief for exercise. Build a cardboard model lping pupils check their answers.	Dittoed contour map. Hubbard's model. (see above.)
layer elevation map once more to illus- lines between colors are really contour h the intervals are much larger than on ands of feet rather than ten or fifty or	Color-layer elevation map of U.S.
racteristics of site which we have just y ones of importance in finding out what xample, look at the physical map of Min- y reason why many Minnesotans leave the --say in California? Why might some e state? Would you ever like to leave ere would you like to go during winter? many go to California, Florida, and Ari- ter vacations and some to live perma- go there? Also point out that some re- e they prefer Minnesota climate. (Adjust e state in which pupils live.)	Physical map of Minnesota or U.S.
U.S. have many different kinds of climate?	

S. Draws inferences from maps.

a. Temperatures va
part of the cou
parts have the
found in northe

1) Temperature
affected in
the equator

S. Interprets map symbols (color layers) in terms of map legend.

S. Applies previously-learned concepts and generalizations to new data.

G. Temperature and seasonal differences are affected in part by distance from the equator.

S. Applies previously-learned concepts and generalizations to new data.

2) Temperature
affected in
large bodie
tion of win

G. The ocean and other large bodies of water do not heat up so rapidly as land nor cool so rapidly as land.

G. Winds which blow over warm bodies of water (or land areas) carry warm air to nearby land areas.

S. Gains information by conducting simple experiments.

a. Temperatures vary considerably from one part of the country to another; not all parts have the great seasonal differences found in northern United States.

1) Temperatures and growing seasons are affected in part by distance from the equator.

2) Temperatures and growing seasons are affected in part by closeness to large bodies of warm water and direction of wind.

41. Show the diagram "Spring Travels Northward" in Carls, et al
Ask: Is there a definite relationship between latitude and
beginning of spring? Does this relationship always hold tr
(Note: This map does not indicate the length of the growing
son but rather only the beginning of it.)

42. Now show pupils a map of the length of growing seasons (per
between frosts). Be sure that they examine the map legend
understand what the color layers mean. Have them note plac
where the seasons are longest, where they are shortest.

Then ask: What would affect the growing season. Pupils sh
be able to identify the distance from the equator as one fa
since it was reviewed in an earlier activity. If not, revi
the idea once more in terms of the relationships between th
earth and the sun.

43. Ask: How can you explain the fact that the growing seasons
longer on the west coast than they are in other places at t
same latitude? Call attention to the location close to the
Pacific and to the direction of prevailing winds in this ar
Why might this location affect the growing season and tempe
tures in general? Pupils who have come through the Center'
third grade course may be able to identify the reason, alth
it should be reviewed at this time. Otherwise, it will be
essary to teach the teach the effects of closeness to large
bodies of warm water by doing one or more of the following
tivities:

a. Do the experiment suggested in activity 5 in the unit on
Paris in grade three. It involves timing the speed with
which soil and water heat up when placed on a warming t
and the speed with which they cool off when placed in ca
over ice.

els Northward" in Carls, et al. tionship between latitude and the is relationship always hold true? cate the length of the growing sea- ning of it.)	Carls, Sorenson, and Howarth, Our United States in a World of Neighbors.
length of growing seasons (periods t they examine the map legend to ers mean. Have them note places . where they are shortest. the growing season. Pupils should nce from the equator as one factor, arlier activity. If not, review f the relationships between the	Borchert and McGuigan, Geography of the New World, p. 24. Plate 13 in Informative Classroom Picture Set on The South.
fact that the growing seasons are they are in other places at the n to the location close to the of prevailing winds in this area. t the growing season and tempera- have come through the Center's e to identify the reason, although time. Otherwise, it will be nec- effects of closeness to large one or more of the following ac-	
d in activity 5 in the unit on involves timing the speed with up when placed on a warming tray hey cool off when placed in cans	Electric warming tray. Cans of same size filled with soil and water. Two thermometers. Ice in large pan.

G: Winds which blow over cold land areas or cold water bring cool air to nearby land areas; winds which blow over warm bodies of water or land areas bring warm air to nearby land areas.

G: Places in the interior of continents tend to have greater extremes of temperature than places along the coast.

S: Interprets map symbols (isometric lines) in terms of map legend.

S: Interprets map symbols (color layers) in terms of map legend.

3) Temperatures are affected in part by elevation.

b. If pupils live in an area close to a river or lake, ask th what happens in winter. Does it freeze over as soon as we get freezing temperatures and snow? Which freezes over so -- small puddles of water or a lake or river? Have you ev seen steam rising from the river or lake in the winter tim before it is frozen over? What does it remind you of? Wh do you think the steam rises or the body of water does not freeze over sooner? Try to use a series of questions to bring our the fact that large bodies of water do not cool so rapidly as do land areas. Then ask questions to help p pils see that these bodies of water do not warm up so rap as land areas either. This should be fairly easy for pupi to understand if they have gone swimming in rivers or lake in the spring or summertime.

44. Now discuss the effects of winds further. If pupils live in Minnesota or the Upper Midwest, remind them of the cold, icy days they sometimes get in the winter. Tell them about the winds coming down from Canada. Are all days this cold? What happens when the winds blow from the south? Ask pupils to no effect of Gulf of Mexico upon temperatures in plains region.

45. Show pupils a map of January temperatures. Ask them what thes lines remind them of (contour lines). What did contour lines connect? (elevations of equal value) Have pupils examine the map legend to find out what these lines connect. (lines of equal mean temperature in January). Or you may wish to begin by giving pupils maps on which a number of mean January tempe atures are located and ask pupils to draw lines between tempe atures which are the same. Then have them compare this map wi

e to a river or lake, ask them
t freeze over as soon as we
now? Which freezes over sooner
lake or river? Have you ever
r or lake in the winter time
does it remind you of? Why
the body of water does not
a series of questions to
odies of water do not cool off
hen ask questions to help pu-
vater do not warm up so rapidly
uld be fairly easy for pupils
swimming in rivers or lakes

urther. If pupils live in
mind them of the cold, icy
ter. Tell them about the
e all days this cold? What
he south? Ask pupils to note
eratures in plains region.

Map of U.S.

atures. Ask them what these
s). What did contour lines
.) Have pupils examine
se lines connect. (lines of
. Or you may wish to begin
mber of mean January temper-
o draw lines between temper-
ve them compare this map with

Map showing mean January and July temperatures in U.S. (e.g. Deasy, et. al., The World's Nations, p. 30.) or see Nystrom trans-

S. Applies previously-learned concepts and generalizations to new data.

G. Temperature is affected by factors such as distance from the equator, elevation, distance from warm water bodies, prevailing winds, and physical features which block winds from certain directions.

G. Temperature is affected in part by elevation; air is cooler at higher elevations than at lower elevations if latitude and distance from the sea are the same.

a contour map to see how the same principle is used in connecting points of equal value by lines. Next have pupils examine the map of January temperatures. Fill in the areas between lines with different colors to show how one could make a color layer map to show the same information. Be sure to add a color key as a legend. Have pupils examine the map to notice temperature patterns. To what extent to the lines follow lines of latitude? How do they explain places where temperatures lines vary from the parallels? Now have pupils examine a map of July temperatures and note variations from the parallels. Ask: How can you explain the differences other than those along the west coast?

parencies on Average Temperature.

If pupils have had the Center's primary grade courses, they should be able to guess that elevation may be a factor. Let them state their guesses about how elevation might be affecting the temperature in certain places. Then let them check their guesses by comparing an elevation map with a temperature map.

If pupils have not come through the earlier courses, begin by having them compare the elevation and temperature maps. Ask pupils to look across the country from east to west along certain lines of latitude. Ask: Where are the temperatures lower -- in areas of high elevation or areas of low elevation? Then do one or more of the following activities to help pupils understand the effects of elevation upon temperatures:

Elevation and temperature maps of U.S.

a. Use activities in the Quechua unit (grade one) to help pupils understand the effects of altitude upon temperature.

b. Tell pupils that temperature is about $3\frac{1}{2}$ degrees colder as one goes up each 1,000 feet. Have a pupil investigate the scientific reason for the differences in temperature at different elevations and prepare a chart showing approximate changes in temperature at different elevations.

S. Uses simple statistical device of mean (average) to analyze data but recognizes that it does not reveal the range and variation in data.

4) Maps o
concea
temper
within

S. Interprets map symbols (isometric lines) in terms of map legend.

4) Maps or charts of mean temperatures conceal the range and variations of temperature both from day to day and within any 24 hour period.

c. Show the filmstrip Effect of High Ground which describes the effect of elevation upon climate.

46. Whether you are just reviewing the effects of elevation upon temperature or teaching them for the first time, be sure to ask: Do you think that all of the changes in temperature which result from elevation can be shown on this map of the United States? Why not? (scale is too small to show all of variations

47. Now ask pupils to look at the temperature maps for their own are What is the average temperature in January? in July? Are all days in January this cold? Are all days in July this hot? Review meaning of average or use one of the following activities to teach it if necessary:

a. Compute the number of children for the average family of pupils in this classroom. If the average is not a whole number, the elusiveness of the average can be pointed out. (Averaging obscures the extremes of any distribution. Generalizations are a form of averaging and youngsters should be aware of the process.)

b. Have students suggest other data for which averaging is an appropriate technique (e.g. Little League batting averages, average class size in the school, etc.) Be sure that pupils have clearly in mind what the average is useful for as well as its limitations in terms of what it hides or obscures.

48. Clip and post the weather map and chart which appears in most daily newspapers. Review meaning of map symbols. Youngsters should have the opportunity to view change in weather patterns and to plot the high and low temperatuaes on a classroom graph.

ffect of High Ground which describes ion upon climate.	Filmstrip: Effect of High Ground, Educational Audio-Visual Inc.
viewing the effects of elevation upon them for the first time, be sure to ask: f the changes in temperature which re- be shown on this map of the United ie is too small to show all of variations)	
at the temperature maps for their own area. perature in January? in July? Are all ld? Are all days in July this hot? Re- or use one of the following activities y:	See temperature maps above.
f children for the average family of pu- om. If the average is not a whole num- of the average can be pointed out. the extremes of any distribution. Gen- orm of averaging and youngsters should be .)	
t other data for which averaging is an e (e.g. Little League batting averages, n the school, etc.) Be sure that pupils what the average is useful for as well n terms of what it hides or obscures.	
r map and chart which appears in most ew meaning of map symbols. Youngsters nity to view change in weather patterns d low temperatuaes on a classroom graph.	

S. Uses simple statistical device of mean (average) to analyze data but recognizes that it does not reveal the range and variation in data.

S. Interprets line graphs.

G. The time of year when an area receives its precipitation is important to agriculture; if it comes during the growing season, it makes it easier to grow crops.

b. Prec
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rain
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1) F
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2) F
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b. Precipitation and moisture patterns differ widely, ranging from almost no rainfall to rainfall of over 110 inches a year on the average.

1) Precipitation may come in the form of snow, soft. gentle rains, or downpours; the type of precipitation is important.

2) Precipitation may be uneven from one month to another; the time when it occurs may be important for vegetation and crops.

Plot the hourly temperature readings for your community
24 hour period on a line graph. This data is available
newspapers or the local weather station. The purpose of
activity is not only to provide experience in graphing b
more important, to illustrate the great temperature rang
Next the question should be raised as to why there is a
ature range.

You may wish to show the filmstrip Weather Maps to teach
how to read such maps. You may also wish to use the lar
weather bureau maps of the U.S.

49. Say: We usually read weather predictions or look at wea
maps because we are interested in whether there will be
precipitation. It can be as important as temperature.

Show pupils an average annual precipitation map of the U
Ask: What must be included when figuring precipitation?
an inch of snow equal an inch of rain? What else would
want to know about an area besides the precipitation in
to decide if there is enough moisture to grow certain ki
crops? Ask further questions to help pupils understand
need for precipitation at certain times of year. (e.g. I
eral, which would be more useful for growing crops, rain
during the growing season or precipitation from Novembe
March?

for your community over a
s data is available from
ion. The purpose of this
rience in graphing but
eat temperature range.
s to why there is a temper-

eather Maps to teach pupils
wish to use the large

Filmstrip:
Weather Maps,
Curriculum Materials Corp.
U.S.; Weather
Bureau maps of
U.S.

:ions or look at weather
ether there will be any
nt as temperature.

tation map of the U.S.
uring precipitation? Does
n? What else would you
ne precipitation in order
e to grow certain kinds of
o pupils understand the
nes of year. (e.g. In gen-
growing crops, rainfall
itation from November to

Plate 13 in Informative Classroom Picture Set on The South.

S. Interprets map symbols (color layers) in terms of map legend.

G. Unevenly distributed phenomena form distintive patterns on the map.

G. Warm air can hold more water than cool air; therefore, warm air picks up moisture and the cooling of air leads to precipitation.

G. If precipitation comes mainly at the hottest time of the year, more is needed than during cool weather to provide an equal amount of moisture.

G. The land in hot regions evaporates quickly as the warm air picks up moisture; therefore, more rain is needed to grow crops in these regions than in regions which are not so hot.

S. Gains information by conducting simple experiments.

3) Precipitation means little unless one also considers evaporation; moisture patterns indicate the effective precipitation after evaporation has been considered.

50. Show pupils the moisture map in Borchert. Have them examine the map legend. Then ask: How does this map differ from the precipitation map? Note particularly differences in where lines are drawn in the great plains area. Why do you think they may differ? Can you think of any factor which we have not considered so far in our discussion of moisture? Use one or more of the following activities to help pupils understand evaporation and differences in the rate of evaporation in different temperature areas and at different times of year.

Borchert and M
Guigan, Geog.
the New World,
p. 21.

a. Ask pupils to think of times when they have seen the sun come out after a shower during the middle of the day. What happens to the pavement? (Can see steam rising as pavement dries out.) Relate idea to evaporation.

b. Fill two pans of the same size with the same amount of water. Place one on the radiator in the room and one across the room from the radiator and on the floor. Have pupils keep a record of how long it takes for the water to disappear in each pan. Then ask: Since the water was not brought to a boil; why did the water disappear? Why do you think the water on the radiator disappeared first? (Perhaps also put a pan in the school basement or some other much cooler spot and have pupils compare temperatures in all three places as well as speed of evaporation.)

Two or three p
of the same si

c. Dip a piece of glass in cold water and dry quickly, or place it in a refrigerator for a time. Now ask a child to blow onto it. What happens? (Help children to understand how warm air loses moisture when it is cooled.)

51. Now ask: Which map is more useful for us to use in looking at agricultural possibilities: the precipitation map or the moisture map? Why?

in Borchert. Have them examine the
does this map differ from the preci-
arly differences in where lines are
ea. Why do you think they may differ?
which we have not considered so far
e? Use one or more of the following
derstand evaporation and differences
n different temperature areas and at

mes when they have seen the sun come
the middle of the day. What happens
e steam rising as pavement dries out.)
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size with the same amount of water.
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the floor. Have pupils keep a record
the water to disappear in each pan.
r was not brought to a boil; why did
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(Perhaps also put a pan in the
ther much cooler spot and have pupils
ll three places as well as speed of

old water and dry quickly, or place
a time. Now ask a child to blow onto
children to understand how warm air
cooled.)

useful for us to use in looking at
the precipitation map or the mois-

Borchert and McGuigan, Geog. of the New World, p. 21.

Two or three pans of the same size.

S: Gains information by studying pictures.

S: Gains information by studying pictures.

G: Deserts have very little rain and precipitation is very irregular from one year to another.

S: Applies previously-learned concepts and generalizations to new data.

S: Sets up hypotheses.

G: Winds which have picked up moisture crossing large bodies of warm water tend to cool as they rise over mountains and so drop their water on the side of the mountain from which they come.

4) Prec
tion
close
curre

4) Precipitation is affected by the direction of the wind, physical barriers, closeness to warm water bodies, ocean currents, etc.

52. Prepare a bulletin board display focusing on pictures of landscapes which indicate a lack of moisture contrasted with those of normal moisture. (If pictures are not available for the bulletin board, text pictures can be substituted.) Ask: Do you think this area gets a great deal of water (moisture) or very little water? What are some of the signs of lack of moisture in these pictures? (clear sky -- lack of water vapor; brown vegetation or lack of vegetation; lack of trees; blowing dust; type of crops grown) Also ask: Where do you think these places are which are shown in these pictures? (Locate on a map.)

53. Project pictures of different desert areas, showing some with almost no vegetation, some with sagebrush, some with bunch grass, etc. How can pupils tell from these pictures which area has less moisture?

54. Assign the task of locating at least four different pictures of U.S. (preferably colored) in any book or magazine which express some of the evidences of an arid area. Assign the task of locating at least four different pictures (preferably colored) in any book or magazine which express some of the evidences of moisture. Organize the children into groups of two or three and have them display their choices and discuss the differences between wet and dry areas. Be sure they locate the places on a physical map of the United States.

55. Have pupils compare the moisture map with a physical relief map. Let them note the pattern of moisture in the U.S. Remind pupils of the westerly winds on the coast. Why would the coastal area get more rain than the land beyond the mountains? Let pupils speculate and then use a diagram to illustrate the reason.

display focusing on pictures of land- ack of moisture contrasted with those of tures are not available for the bulletin be substituted.) Ask: Do you think al of water (moisture) or very little the signs of lack of moisture in these lack of water vapor; brown vegetation ck of trees; blowing dust; type of crops do you think these places are which are (Locate on a map.)	See back issues of National Geographic and Arizona Highways.
rent desert areas, showing some with al- with sagebrush, some with bunch grass, from these pictures which area has less	Filmstrip: Life in the Desert, E.B.F. Curriculum Color Prints. Knight, First Book of Deserts.
ng at least four different pictures of in any book or magazine which express an arid area. Assign the task of lo- erent pictures (preferably colored) in express some of the evidences of mois- ren into groups of two or three and have s and discuss the differences between re they locate the places on a physical	Physical map of U.S.
oisture map with a physical relief map. of moisture in the U.S. Remind pupils the coast. Why would the coastal area nd beyond the mountains? Let pupils diagram to illustrate the reason.	Life Editors. Weather, p. 98 shows diagram.

G. As winds descend into valleys from mountain ridges, they are warmed and tend to pick up moisture.

S. Sets up hypotheses.

S. Applies previously-learned concepts and generalizations to new data.

G. Winds which cross cold water currents, are cooled and will pick up moisture rather than dropping it as they cross land areas which are warmer than the water.

A. IS SCEPTICAL OF THE FINALITY OF KNOWLEDGE; CONSIDERS GENERALIZATIONS AND THEORIES AS TENTATIVE, ALWAYS SUBJECT TO CHANGE IN THE LIGHT OF NEW EVIDENCE.

A. RESPECTS EVIDENCE EVEN WHEN IT CONTRADICTS PRECONCEPTIONS.

S. Applies previously-learned concepts and generalizations to new data.

56. Now have pupils examine the moisture map for the west coast. What differences do they note between the southern part of the coast and the northern part? Let them look at rainfall maps for winter and summer. What differences are there for these two regions? Since both areas are by the ocean, what might account for the differences? Let pupils set up hypotheses and then show them a map of ocean currents and prevailing winds. Ask: Where does this current come from? Would the water there be warm or cold? Since the water does not change temperature very rapidly, would the water be warmer or colder than water off the southern part of the west coast? What would happen to the winds blowing over the current in the direction of the mainland? Since these winds are cooled by the ocean current, would they pick up much water in the form of evaporation? What would happen when these cool winds come to the land area along the outer coast? Would they drop water or pick up moisture as they warms up over the land area? What would happen to rainfall on this part of the coast? etc. Would there be any difference in rainfall in winter and in summer months? Why? When would you expect there to be the most rainfall along the southern coast? Now have pupils check maps of winter and spring precipitation to check on their guesses.

57. You may wish to show the film Life in Mediterranean Lands (California) which shows both the causes of the Mediterranean climate in Southern California and the way in which people live there.

58. Now ask: Where do you think the upper Midwest (point out) gets its moisture from? (If necessary show them on the map.) Then ask: Why does Minnesota get less moisture than the states to

the moisture map for the west coast. What between the southern part of the coast Let them look at rainfall maps for winter ences are there for these two regions? the ocean, what might account for the dif- t up hypotheses and then show them a map evailing winds. Ask: Where does this d the water there be warm or cold? Since e temperature very rapidly, would the r than water off the southern part of the happen to the winds blowing over the cur- the mainland? Since these winds are ent, would they pick up much water in the at would happen when these cool winds along the outer coast? Would they drop é as they warms up over the land area? What on this part of the coast? etc. Would in rainfall in winter and in summer months? ect there to be the most rainfall along the e pupils check maps of winter and spring n their guesses.	Borchert and McGuigan, Geography of the New World, p. 21, Map of U.S. with acetate overlay showing prevailing winds and ocean currents along Pacific coast.
film Life in Mediterranean Lands (Cali- the causes of the Mediterranean climate nd the way in which people live there.	Film: Life in Mediterranean Lands (California), 11 min., Coronet.
hink the upper Midwest (point out) gets necessary show them on the map.) Then get less moisture than the states to	Physical map of U.S.

S. Sets up hypotheses.

S. Applies previously-learned concepts and generalizations to new data. 5

G. Water is evaporated from the oceans, is carried in clouds by the wind, is dropped on land areas through precipitation, and is then evaporated once more or runs off by way of rivers and underground streams to the oceans.

G. If lakes have no outlets, they are likely to develop into salt-water lakes or dry up into salt beds. 6

S. Sets up hypotheses. 7

G. Differences in air temperature lead to movements of air and winds. As warm air rises, cooler air moves in to replace it.

5) Moisture comes from the warm oceans and other large bodies of warm water and is transported by winds in cloud form, is dropped in the form of precipitation, and most of it evaporates or returns to the oceans by way of run-off from the land; the United States is drained by many rivers and different drainage systems.

6) Some water drains into lakes which have no outlet; evaporation eventually develops these lakes into salt water bodies or dries them up and turns them into salt beds.

7) Precipitation is affected by sun-earth relationships because they create prevailing winds and ocean currents.

the south of Minnesota? Why doesn't it get much moisture from the Great Lakes? What would happen to winds blowing across the Great Lakes? Would they pick up much moisture? Why or why not?

59. At this point it might be wise to stop and discuss the hydrological cycle. Pupils have learned that warm air picks up moisture and that when the air cools, it drops the moisture in the form of precipitation. Ask: What happens to the water or snow after it is dropped? Since most of our precipitation comes from the moisture picked up from the oceans, why don't the oceans dry up? Let pupils speculate about what happens to the precipitation. Perhaps ask questions about what they have seen happening after a big rainfall or when snow melts in the spring (e.g. water running into drains; high water in rivers; floods; etc.) What else have they learned about what happens to some of the precipitation in very dry areas? (evaporated). Is it only in very dry areas that water is evaporated into the air? (Relate to need to keep watering plants in house and to what pupils know about plants.) Now show pupils a diagram which illustrates the hydrological cycle. Perhaps prepare a simplified version of the diagram in Meyer. Or you may wish to show the film The Water Cycle.

60. Tell the class that in some places water drains into inland lakes which have no outlets. Locate the Great Salt Lake. Why might it have no outlet? Call attention to its name and describe briefly why the water becomes salty. Perhaps also show some of places in Nevada where small bodies of such water collect and dry out and become sources for salt.

61. Remind pupils that they have learned that both prevailing winds and ocean currents affect climate. Then tell them that these features are caused by the rotation of the earth and its revolution around the sun. Let pupils guess about ways in which these movements might affect winds and currents. Then use several activities such as the following to help pupil understand these effects:

esn't it get much moisture from
ppen to winds blowing across the
p much moisture? Why or why not?

to stop and discuss the hydrolog-
d that warm air picks up moisture
drops the moisture in the form of
ens to the water or snow after it
precipitation comes from the mois-
why don't the oceans dry up? Let
pens to the precipitation. Per-
hey have seen happening after a
in the spring (e.g. water running
rs; floods; etc.) What else have
to some of the precipitation in
ls it only in very dry areas that
r? (Relate to need to keep water-
pupils know about plants.) Now
ustrates the hydrological cycle.
rsion of the diagram in Meyer. Or
he Water Cycle.

Meyer and Strietel-
meier, Geography
in World Society, p.
186.
Film: The Water Cycle,
11 min., E.B.F.

ces water drains into inland lakes
the Great Salt Lake. Why might it
to its name and describe briefly
erhaps also show some of places in
ch water collect and dry out and

Map of U.S. and
large-scale maps
of Utah.
Pictures of salt
areas of Nevada.

arned that both prevailing winds
te. Then tell them that these
tion of the earth and its revolu-
s guess about ways in which these
d currents. Then use several ac-
to help pupil understand these ef-

G. The direction of prevailing winds is caused both directly and indirectly by the rotation of the earth and its revolution around the sun.

G. The ocean currents are caused largely by the direction of prevailing winds and the rotation of the earth.

S. Gains information by observing the world around him.

S. Gains information by conducting simple experiments.

A. IS SCEPTICAL OF THE FINALITY OF KNOWLEDGE: CONSIDERS GENERALIZATIONS AND THEORIES AS TENTATIVE, ALWAYS SUBJECT TO CHANGE IN THE LIGHT OF NEW EVIDENCE.

a. Ask them to think about what seems to be happening to air close to a hot air outlet or a radiator? (It is rising.) Where is air cooler -- on floors or higher up in a room? (Perhaps let pupils use thermometers to check on their statements.) Point out that some air may be entering a room through cracks in windows in which air circulates in room.

b. Use a smoke chimney (as suggested in books on teaching el mentary science) or charts which illustrate the way in wh warm and cold air moves.

c. Now ask: In what parts of the world would the air be hot colder? What would happen as a result of these differenc Use a diagram to explain if necessary. Then use some of diagrams and pictures in The World We Live to explain effects of differences in temperature and the rotation of earth upon wind directions.

d. Now ask: When wind blows over a body of water, what happ to the water? (Ask children to think of what they have s rivers and lakes.) Perhaps have a child blow hard on wat a pan of water or start a fan blowing on water in a large of water. Put a toothpick into the water so that childre see how the water moves. Then use diagrams and pictures illustrate how the ocean currents are affected by the pre ing winds, although they are deflected somewhat by the ro of the earth.

62. Review use of maps and introduce affects of climate by showi Maps And Their Meaning. The meaning of the different colors a physical map is explained and visualized. The colors are on the map to represent different land and water areas. The

ems to be happening to air radiator? (It is rising.) s or higher up in a room? heters to check on their me air may be entering a in which air circulates in a	
ed in books on teaching ele- h illustrate the way in which	
world would the air be hotter? result of these differences? essary. Then use some of the rld We Live In to explain the rature and the rotation of the	Life Editorial Staff, The World We Live In, pp. 74-75.
a body of water, what happens think of what they have seen on e a child blow hard on water in lowing on water in a larger pan the water so that children can use diagrams and pictures to ts are affected by the prevail- flected somewhat by the rotation	Life Editorial Staff, The World We Live In, 31-32. Pan of water.
ffects of climate by showing: ng of the different colors of sualized. The colors are used land and water areas. The	Film: Maps and Their Meaning, 1½ reels, Academy.

S. Uses simple statistical device of mean (average) to analyze data, but recognizes that it does not reveal the range and variation in data.

S. Classifies data.

Understands concept of climate.

A. IS SCEPTICAL OF THEORIES OF SINGLE CAUSATION.

G. The rotation and inclination of the earth and the revolution of the earth around the sun has a number of effects upon climate.

G. Precipitation is affected by factors such as distance from bodies of warm water, wind direction, temperature, ocean currents, and physical features which force winds to rise.

G. Temperature is affected by such factors as distance from the equator, elevation, distance from warm water bodies, prevailing winds, and physical features which block winds from certain directions.

c. Climate
the cou
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humidit
deals w
sphere;
typical

c. Climate varies widely from one part of the country to another; it results from different combinations of precipitation humidity, and temperature. Weather deals with daily changes in the atmosphere; climate deals with averages or typical weather conditions.

film shows the types of land found in each of the color zones. It shows how man uses the land in each color zone. It also ex plains the important effects of altitude, latitude and rainfal

63. Say: We have been talking about differences in precipitation and temperature around the country. What do you think we mean by climate? Are we referring only to temperature? to moisture How does climate differ from weather? (Explain that climate is dealing with <u>average</u> weather conditions.)

Now have pupils compare precipitation and temperature maps of the U.S. to identify places with different combinations of tem peratures and precipitation. (e.g. Places which are cold in winter and cool in summer and relatively wet; places which are warm in winter and cool in summer and relatively wet, etc.) P haps have pupils develop their own categories of possible comb ation of conditions as they examine the maps. Have them prepa maps to illustrate these conditions. Then they might compare their maps and categories with those developed by geographers. (Use a simplified classification system used by geographers.)

Pupils should be able to note that climate can differ consider ably even within one state. Let pupils who have travelled muc in Minnesota describe differences between northern and souther Minnesota to note climatic differences within this one state.

Have pupils summarize the factors affecting climate, as they h studied them so far.

land found in each of the color zones.
he land in each color zone. It also ex-
fects of altitude, latitude and rainfall.

ing about differences in precipitation
the country. What do you think we mean
erring only to temperature? to moisture?
from weather? (Explain that climate
weather conditions.)

precipitation and temperature maps of
aces with different combinations of tem-
tion. (e.g. Places which are cold in
er and relatively wet; places which are
in summer and relatively wet, etc.) Per-
p their own categories of possible combin-
they examine the maps. Have them prepare
e conditions. Then they might compare
es with those developed by geographers.
ification system used by geographers.)

Precipitation and temperature maps mentioned above.

Climate map (e.g. map transparency from Nystrom).

o note that climate can differ consider-
ate. Let pupils who have travelled much
ifferences between northern and southern
tic differences within this one state.

he factors affecting climate, as they have

G. Man changes the character of the earth.

d. Man affects climate.

A. IS CURIOUS ABOUT SOCIAL DATA.

A. IS SCEPTICAL OF THE FINALITY OF KNOWLEDGE; CONSIDERS GENERALIZATIONS AND THEORIES AS TENTATIVE, ALWAYS SUBJECT TO CHANGE IN THE LIGHT OF NEW EVIDENCE.

G. Vegetation is affected by temperature and precipitation.

4. Vegetation is affected by climate.

S. Sets up hypotheses.

S. Applies previously-learned concepts and generalizations to new data.

64. Ask: Can you think of any ways in which man has or can mod climate (either temperature or precipitation or both)? Som pupils may have heard about seeding rain clouds. However, probably have not thought about ways in which man has modifi climate in other ways. You might like to use some of the f ing examples to illustrate them.

a. Tell the class that Chicago's frost-free season is 197 d as compared to 167 days for surrounding counties. How m they account for this? If pupils have spent vacations i rural areas during the summertime, ask them how temperat at night differ from temperatures in cities at night? (lyze effect of pavement and cement in holding and throwi off heat.)

b. Ask: What might be the effect of covering so much of a with pavement and buildings upon moisture in the area? will run off, more so than in rural areas where it can s in better). What might be the effect of having less gra fewer trees than in rural areas (less evaporation). Wha be the effect of all of the smoke in the air? (decrease light and particularly certain kinds of light -- ultravi light). Smoke affects precipitation.

c. Tell the class Bryson's description of effects of dust i and his hypotheses about the creation of a desert in the sub-continent.

65. Now ask: How do you think climate might affect natural veg tion in an area? Let pupils make guesses. Remind them of pictures they examined on moisture. How did moisture affec vegetation? Is vegetation affected only by moisture? How temperature affect it? Show pupils pictures of vegetation the tundra in the Rocky Mountains where there is plenty of ture. (If possible use pictures which show snow in the are illustrate the moisture.) Ask: Why are these flowers so s Why do you think there aren't any trees in the picture? If

any ways in which man has or can modify
ature or precipitation or both)? Some
about seeding rain clouds. However, they
ght about ways in which man has modified
You might like to use some of the follow-
rate them.

Chicago's frost-free season is 197 days
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the effect of covering so much of a city
uildings upon moisture in the area? (much
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rly certain kinds of light -- ultraviolet
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about the creation of a desert in the Indian

hink climate might affect natural vegeta-
pupils make guesses. Remind them of the
on moisture. How did moisture affect
tion affected only by moisture? How would
Show pupils pictures of vegetation on
y Mountains where there is plenty of mois-
e pictures which show snow in the area to
e.) Ask: Why are these flowers so small?
aren't any trees in the picture? If

For examples of effects of man upon climate, see Reid Bryson, "Is Man Changing the Climate of Earth?", Saturday Review of Literature, April 1, 1967, pp. 52-55.

G. Trees need more water than long grasses in order to grow; long grasses need more water than short grasses.

G. Grass will grow in some areas which are too cold for trees.

S. Draws inferences from a comparison of different map patterns of the same area.

S. Tests hypotheses against data.

A. SEARCHES FOR EVIDENCE TO DISPROVE HYPOTHESES, NOT JUST TO PROVE THEM.

G. Vegetation is affected in part by temperature and precipitation.

G. Vegetation and what can be grown is affected in part by soil.

S. Gains information by conducting simple experiments.

G. Vegetation and what can be grown is affected in part by soil;

5. Soils affect vegetatio
can be grwon and in tu
vegetation and crops a
rock from which they a
and by wind, water, an

a. Soils affect vegeta
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5. Soils affect vegetation and the crops which can be grwon and in turn are affected by vegetation and crops as well as by the basic rock from which they are formed, by climate, and by wind, water, and glacial action.

conducting

a. Soils affect vegetation and what can be grown.

an be grown
y soil;

pupils have come through the Center's primary grades, as what they learned about vegetation in the high mountains Peru when they studied the Quechua. Have pupils sugges ble types of natural vegetation for different parts of t try.

66. Have pupils compare a map of natural vegetation in this with maps of temperature and precipitation and check th potheses about vegetation against the data on the map.

67. View and discuss the filmstrip, Green Lands. This film illustrates various types of vegetation from high to lo tudes and along the fortieth parallel to show environme factors such as growing season, rainfall, altitude and on living conditions.

68. Show pupils two pictures in the dairy region of southern sin, one of which shows good farm land and one of which poor land for farming. Point out that the climate and are just about the same. What can they tell about the Are they the same or different? How can pupils account differences in the farms then? (Soil)

69. Obtain samples of the major soil types of the United St contacting the Department of Agronomy in the appropriat Universities. An interesting display could be made of specimens and the youngsters could observe first hand th

ough the Center's primary grades, ask them
out vegetation in the high mountains of
ed the Quechua. Have pupils suggest possi-
vegetation for different parts of the coun-

map of natural vegetation in this country
ture and precipitation and check their hy-
ation against the data on the map.

Map of natural vegetation in U.S. (e.g. Transparency from Nystrom Co.)

filmstrip; Green Lands. This filmstrip
types of vegetation from high to low lati-
fortieth parallel to show environmental
ing season, rainfall, altitude and latitude

Filmstrip: Green Lands, Society for Visual Education.

ures in the dairy region of southern Wiscon-
ows good farm land and one of which shows
g. Point out that the climate and elevation
ame. What can they tell about the landforms?
different? How can pupils account for the
arms then? (Soil)

Kohn and Drummond, The World Today, p. 66.

e major soil types of the United States by
tment of Agronomy in the appropriate State
teresting display could be made of these
ungsters could observe first hand the varia-

S. Draw inferences from a comparison of different map patterns of the same area.

G. Soil in a particular place is affected by the type of basic rock in the region, the climate, vegetation, erosion, wind, glaciers, and rivers which move soil.

S. Sets up hypotheses.

G. Nature changes the character of the earth through biotic processes.

G. Man changes the character of the earth.

G. Erosion of soil results from water and wind; it is more likely in areas where grass

b. Soils are affected by vegetation and by climate.

c. Soils are affected by the basic rock in the region, and by erosion.

d. Man affects soils.

tions in color and texture, also the effects of weathering and leaching can be readily noted. Make a map to show where soils come from.

Place portions of each of the above samples of soil in small m cartons. Plant several kinds of seeds in each box. Is there variation in the growth of the seeds? What caused it? NOTE: Try to be as scientific as possible. Be sure that each box re ceives equal sunshine and moisture.

70. After pupils have examined different kinds of soils, show them more complete soils map, a vegetation map, and a climatic map. What relationships do they see between climate and vegetation? Between vegetation and soils? Between rainfall and soils? Le pupils set up some hypotheses.

71. Review what pupils learned earlier, when studying how landform were created, about the way in which water, wind, and glaciers move rocks and soil and about how soil is made. Perhaps show the film Birth of Soil or What is Soil? If necessary, read a- loud or tell children additional information about effect of vegetation and climate on soil.

72. Show a filmstrip which illustrates how man affects soils, both by making erosion easier and by farming practices which exhaus it.

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Make a map to show where soils

boye samples of soil in small milk
f seeds in each box. Is there a
seeds? What caused it? NOTE:
ible. Be sure that each box re-
ure.

erent kinds of soils, show them a
tation map, and a climatic map.
between climate and vegetation?
Between rainfall and soils? Let

Soils map of U.S. (e.g. Deasy, et.al., The Worlds' Nations, p. 44, Goodes Atlas.) Vegetation-climatic maps (e.g. Nystrom transparencies.)

ier, when studying how landforms
which water, wind, and glaciers
ow soil is made. Perhaps show
is Soil? If necessary, read a-
l information about effect of

Films: Birth of Soil, What is Soil? E.B.F.

tes how man affects soils, both
farming practices which exhaust

Filmstrips: Soil Resources, Curriculum Materials Corp.; Saving Our Soil, E.B.F.

and trees have been removed.

V. United States Geogr
study-ing only phys
many ways in which
cal environment.

G. Political boundaries are man-made and frequently do not follow any natural physical boundaries.

A. Political bound
quently they do
boundaries.

S. Draws inferences from a comparison of different map patterns of the same area.

S. Sets up hypotheses.

B. Men's agricultu
by but not dete

V. United States Geography cannot be understood by studying only physical features; we must study the many ways in which man uses and modifies the physical environment.

A. Political boundaries are drawn by man; frequently they do not coincide with any natural boundaries.

B. Men's agricultural activities are affected by but not determined by physical features.

73. Say: We have seen several instances already of how man has mod
ified physical features of the countryside. What others can yo
think of offhand? (List on chart.) Say: We will try to add t
this list as we continue to study the United States. We also n
to study how man lives in different parts of the country and di
ferent states if we are to understand what these places are lik

74. Point out to the class that pupils have frequently referred to
states and that earlier they referred to countries which borde
on the U.S. Show the class a political map of the United State
which shows state boundary lines and boundaries with Canada and
Mexico. Have them identify the symbols used to show these
boundaries. Then ask: From what you already know, do you thin
many of these boundary lines follow natural boundary lines of
some kind? Compare the map with a physical map and with cli-
matic maps. Where do some of the boundaries of physical featur
coincide? Do they generally coincide or do these man-made boun
aries cut across natural boundaries? Perhaps show pupils pic-
tures of state borders or even the border with Canada where no
natural boundary line can be seen.

Ask: Since political boundary lines between states and countri
frequently do not follow any natural boundary lines, why are th
important?

75. Say: We have examined climatic maps, soil maps, and landform
maps. Do you think there would be any relationship between la
form, climate, soil and agriculture in this country? Do yo
think the physical features will determine where man farms and
what and how he farms in a particular place? Why? Let pupils
set up hypotheses about these relationships, suggest types of
farming which might be expected in certain parts of the countr
and identify places where they do not expect to find any agri-
culture.

tances already of how man has mod-
countryside. What others can you
art.) Say: We will try to add to
udy the United States. We also need
ferent parts of the country and dif-
erstand what these places are like.

pils have frequently referred to
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political map of the United States
nes and boundaries with Canada and
he symbols used to show these
what you already know; do you think
follow natural boundary lines of
th a physical map and with cli-
the boundaries of physical features
coincide or do these man-made bound-
daries? Perhaps show pupils pic-
n the border with Canada where no
seen.

Map of United States showing political boundaries.
Relief map of U.S.
Climatic map of U.S.
(For sources, see earlier references above.)
For pictures see Nystrom's Map Symbols and Geographic Terms Charts or make your own slides.

y lines between states and countries
natural boundary lines, why are they

ic maps, soil maps, and landform
ld be any relationship between land-
griculture in this country? Do you
ill determine where man farms and
rticular place? Why? Let pupils
relationships, suggest types of
ed in certain parts of the country,
y do not expect to find any agri-

G. Different crops need differing amounts of rainfall and differing temperatures and number of frost-free days in order to grow; moreover, they need water and dryness at different times during their period of growth.

G. Man changes the character of the earth. (Irrigation makes it possible to grow crops on land which otherwise would be too dry.)

S. Tests hypotheses against data.

G. Man uses his physical environment in terms of his cultural values, perceptions, and level of technology.

A. SEARCHES FOR EVIDENCE TO DISPROVE HYPOTHESES, NOT JUST TO PROVE THEM.

A. RESPECTS EVIDENCE EVEN WHEN IT CONTRADICTS PRECONCEPTIONS.

S. Sets up hypotheses.

G. Machinery and power make possible greater production per person.

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2. The value of land tends to be related to a number of factors such as moisture, soil, temperature and growing season, population densities, and transportation facilities.

76. Now have pupils examine maps of different types of agriculture in the U.S., including one which shows major types of farming activities as well as a series of maps showing different kinds of crops and animal production. Compare these once more with mpas of climate, soil, and landforms. What relationships do they see? Were their guesses correct about where agriculture would and would not be found and about types of farming activity? Probably many pupils guessed that there would be little agriculture in desert areas in the southwest. Show them pictures of some of the rich agricultural areas there where irrigation is used to make crops possible. Have natural features determined where people farm?

77. Say: Let's look now at some other possible relationships between physical features of areas and agriculture. After ascertaining that the youngsters are aware of the size of an acre of land, have the pupils examine the "Number and Acreage of Farms" chart. What is happening to the number of farms? Why? What is happening to the size of farms? Census figures reveal that there is a decline in the number of farmers too. Discuss: How is it possible for fewer farmers to take care of more land? (Emphasize

aps of different types of agriculture e which shows major types of farming eries of maps showing different kinds ction. Compare these once more with d landforms. What relationships do they correct about where agriculture would d about types of farming activity? Prob- that there would be little agriculture in west. Show them pictures of some of the here where irrigation is used to make ural features determined where people	e.g. Map of Agricultural Regions from folder of pictures on The South, Informative Classroom Pictures Publications, plate 16. Series of maps in Goode's School Atlas. Series of maps in Deasy, et.al., The World's Nations, pp. 47, 51. Map of agricultural regions in Finch et. al., Earth and Its Resources, p. 479. Maps of Climate, soil, and landforms, (see above). Pictures in old issues of Arizona Highways; in U.S. Department of Interior, Natural Resources of Nevada; National Geographic, March, 1963, pp. 316-317.
ome other possible relationships between s and agriculture. After ascertaining ware of the size of an acre of land, he "Number and Acreage of Farms" chart. number of farms? Why? What is happen- Census figures reveal that there is f farmers too. Discuss: How is it pos- o take care of more land? (Emphasize	See chart in appendix. Pictures such as those on pp. 31, 39, 42, 44 of McLaughlin and Editors of Time-Life Books, The Heartland. Or see Informa-

S. Sets up hypotheses.

S. Figures out ways of testing hypotheses.

A. IS CURIOUS ABOUT SOCIAL DATA.

S. Draws inferences from a comparison of different map patterns of the same area.

S. Test hypothese against data.

the great mechanization of farms and show pictures to illustrate.)

Note the great increases in land values for some of the states since 1950. Why? It is possible to prepare hypotheses to be tested by the data presented in the chart. If the chart appears too complex for a given class, use selected states for discussion, such as Minnesota, New Jersey and Arizona.

78. Say: Suppose geographers have an hypotheses that the average size of farms is related to land values. You be geographers and try to think what relationships might exist. How could you test your hypotheses given the data on these charts? (Make maps). Have pupils make two maps, one of average farm size and one of land values and compare them. You might follow the procedures below:

a. A committee or all members of the class might map the variation in average acreage of farms in the U.S. The data for this map is presented in the chart on "Number and Acreage of Farms." (These maps can be used in later units when studying each of the regions.) The following key should aid in adequately presenting the variation: under 100 acres; 101-150; 151-200; 201-250; 251-350; 351-500; 501-750; 751-1500; over 1500 acres.

b. A committee or all members of the class might map the variation in the value of land in the United States. The data needed for this map is presented in the chart on "Number and Acreage of Farms." These maps should be used when studying each of the regions. The following key should aid in adequately presenting the variation in land values: under $50 per acre; $50-$100; $101-$150; $151-$200; $201-$250; $251-$300; $301-$350; over $350.

c. Have pupils compare the two maps which they have just made on farm size and land values. They should locate the states with the highest land values and the lowest land values and notice farm sizes in these states. Ask: Were your guesses right or wrong?

of farms and show pictures to illustrate.)

in land values for some of the states possible to prepare hypotheses to be nted in the chart. If the chart appears class, use selected states for discus- New Jersey and Arizona.

s have an hypotheses that the average to land values. You be geographers and onships might exist. How could you test e data on these charts? (Make maps). s, one of average farm size and one of them. You might follow the procedures

mbers of the class might map the varia- ge of farms in the U.S. The data for in the chart on "Number and Acreage s can be used in later units when study- ns.) The following key should aid in the variation: under 100 acres; 101-150; -350; 351-500; 501-750; 751-1500; over

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e two maps which they have just made on lues. They should locate the states with s and the lowest land values and notice tates. Ask: Were your guesses right or

tive Classroom Pic- ture set on South, plates 17 and 36 which show 2 ways of picking cotton.

S. Uses scatter diagram to test hypotheses.

A. RESPECTS EVIDENCE EVEN WHEN IT CONTRADICTS PRECONCEPTIONS.

S. Sets up hypotheses.

S. Figures out ways of testing hypotheses.

S. Draws inferences from a comparison of different map patterns of the same area.

79. Now point out that geographers have another tool for identifying relationships which may even be easier to use on certain kinds of data when one is interested in a relationship rather than in noting specific areas of the country. It is called a scatter diagram. Draw the axis for such a diagram on the chalkboard, put in the appropriate scales, and then plot the points for the first three states, making sure that pupils understand how such diagrams are made.

Now begin a new diagram with the vertical and horizontal scales marked. Ask: Suppose land values are always higher when the average size of farms is larger and lower when the average size of farms is smaller. Where would we find the dots placed on this map? Let pupils make suggestions and then plot an imaginary scatter diagram which would fit such a situation. (Provide some variation from a straight line, but let the dots cluster around the line which can be drawn through them to show the close correlation of this kind.) Now plot another imaginary scatter diagram to illustrate what one would look like if land values were always higher when the average size of farms is smaller and lower when the average size of farms is higher. (Again draw in a line through the dots to show how the dots cluster around a straight line.)

Now have each pupil use graph paper to plot his own scatter diagram for the data presented for each state in 1960. Then ask: Can you draw a line through these dots so that most dots lie close to it? Does your scatter diagram resemble either of our model diagrams? What does your scatter diagram tell you about the relationship of farm size to farm values?

80. Now ask: Can you think of any other factors which might affect farm values? Let pupils suggest hypotheses and ways of testing them. As usual record them on the chalkboard. Then do the following or similar activities, checking the list of hypotheses and adding to them.

t geographers have another tool for identifying
ch may even be easier to use on certain kinds of
interested in a relationship rather than in not-
s of the country. It is called a scatter dia-
xis for such a diagram on the chalkboard, put
e scales, and then plot the points for the first
ing sure that pupils understand how such diagrams

For example of how to build a scatter diagram, see Broek, Geography, Its Scope and Spirit, pp. 60-62.
Data on farm size and land values in Appendix.

iagram with the vertical and horizontal scales
ppose land values are always higher when the
arms is larger and lower when the average size
er. Where would we find the dots placed on this
make suggestions and then plot an imaginary
hich would fit such a situation. (Provide some
straight line, but let the dots cluster around
n be drawn through them to show the close corre-
nd.) Now plot another imaginary scatter diagram
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of farms is higher. (Again draw in a line through
how the dots cluster around a straight line.)

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presented for each state in 1960. Then ask:
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s your scatter diagram resemble either of our
What does your scatter diagram tell you about
of farm size to farm values?

think of any other factors which might affect
pupils suggest hypotheses and ways of testing
ecord them on the chalkboard. Then do the fol-
activities, checking the list of hypotheses
m.

S. Tests hypotheses against data.

A. SEARCHES FOR EVIDENCE TO DISPROVE HYPOTHESES, NOT JUST TO PROVE THEM.

Al. IS SCEPTICAL OF THEORIES OF SINGLE CAUSATION IN THE SOCIAL SCIENCES.

G. The value of land tends to be related to a number of factors such as moisture, soil, temperature and growing season, population density, and transportation facilities.

a. Have pupils compare the map of land values with the moisture map of the U.S. Ask: Does there seem to be any relationship between land values and moisture? Also have pupils compare the map of average farm size with the moisture map and look for possible relationships.

b. Have pupils compare the map of land values with a map of growing seasons. Ask: Is there any relationship between length of growing season and land values?

c. Have pupils compare the map of land values with a map of soi Ask: Is there any relationship? If so, what? Would you expect farms to be smaller or larger in areas of poor soils? Use a Minnesota map to check hypotheses.

he map of land values with the moisture Does there seem to be any relationship nd moisture? Also have pupils compare rm size with the moisture map and look ships.	Pupils' maps of land values and farm sizes. Moisture map in Borchert and McGuigan, Geography of the New World, p. 21.
he map of land values with a map of grows there any relationship between length land values?	Pupils' map of land values. Map of Growing Season (e.g. Borchert and McGuigan, Geography of the New World, p. 24.
ne map of land values with a map of soils. lationship? If so, what? Would you exler or larger in areas of poor soils? Why? o check hypotheses.	Pupils' maps of land values. Map of soils (e.g. Deasy, et.al., World's Nations, p. 44. Goodes World Atlas.

S. Uses simple statistical device of mean (average) to analyze data, but recognizes that it does not reveal the range and variations in data.

C. Population is not
United States; th
results from many
ing and many shif
tion patterns.

1. In 1960 there
per square mil

Understands concept of square mile.

S. Gains information by making survey.

2. These people w
across the cou

G. Large cities are characterized by a large number of people per square mile.

a. There are
in rural a

C. Population is not distributed evenly across the United States; the uneven population pattern results from many factors. Population is growing and many shifts are taking place in population patterns.

1. In 1960 there was an average of 50 people per square mile in this country.

2. These people were distributed very unevenly across the country.

   a. There are more people in urban areas than in rural areas.

d. Compare a map of farm values with a map of population density. Is there any relationship? If so, what? How might you explain this relationship?

e. Set up a hypothetical situation in which pupils are on a horseback trip into a wilderness area which can be reached only by horse trail. They discover some land with excellent physical features for growing crops. How valuable would this land be at the present time? Why? Let pupils set up hypotheses about the relationship of land values and transportation and check later during case studies.

81. Say: We have been looking at agricultural patterns in the U.S. Now we are going to look at where people live in this country and at what is happening to the number of people in the country.

Tell the class that in 1960 there were 50 people per square mile in this country. What do pupils think this statement means? Review meaning of averages and use one or more of the following activities to teach pupils the meaning of square mile and density of population per square mile.

a. Using a map of the local area, have pupils locate the school which they attend. Then mark off a square mile, either using the school as the center of the square or at one corner. Have pupils discuss all of the things which can be found within this square mile. Also have them figure out how far they would have to walk if they were to walk around the square mile.

b. If the school is in a town which has a fairly regular pattern of streets and avenues, you might take pupils on a bus trip. First drive around the border of the square mile. Have pupils count the number of blocks and keep a record of the number of

rm values with a map of population density.
onship? If so, what? How might you ex-
ship?

Pupils' maps of farm values.
Population Density map (e.g. Informative Classroom Pictures set on Northeast, plate 16.)

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lderness area which can be reached only by
discover some land with excellent physical
g crops. How valuable would this land be
? Why? Let pupils set up hypotheses about
land values and transportation and check
tudies.

king at agricultural patterns in the U.S.
ok at where people live in this country
ng to the number of people in the country.

1960 there were 50 people per square mile
do pupils think this statement means? Re-
es and use one or more of the following
oils the meaning of square mile and density
re mile.

local area, have pupils locate the school
Then mark off a square mile, either using
enter of the square or at one corner. Have
of the things which can be found within
Also have them figure out how far they would
y were to walk around the square mile.

a town which has a fairly regular pattern
ues, you might take pupils on a bus trip.
the border of the square mile. Have pupils
blocks and keep a record of the number of

Understands concept of population density.

S. Uses simple statistical device of mean (average) to analyze data, but recognizes that it does not reveal the range and variations in data.

S. Sets up hypotheses.

b. Populat
a varie
by econ

G. Population is distributed unevenly over the earth's surface many of the land areas are thinly populated.

G. Men carry on more activities on plains than in hills and more in hills than in mountains except in the low latitudes.

S. Interprets map symbols (color layers) in terms of map legend.

S. Draws inferences from a comparison of different map patterns of the same area.

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in mountains
atitudes.

ots color
map legend.

om a compar-
ap patterns

b. Population distribution is affected by a variety of physical factors as well as by economic activities in an area.

houses they see. Then dirve up and down the blocks, so tha the bus traverses all of the streets. Let pupils count the houses on these streets. How many houses were found in the square mile within their school area? If the number is mor than 25 ask: Do you think that more than 50 people live in this square mile? Why?

c. Use local census figures and the number of square miles wit in the local town and figure out the average number of peop per square mile. Is it higher or lower than the average of 50 per square mile for the country as a whole? What might count for the difference?

d. Now tell pupils the population density for their state. Is it lower or higher than the population density in their squ mile? In town areas it will be much smaller. In rural are it will be larger. Ask: How can you explain the differenc

82. Ask: Do you think we will find more people in areas which are used largely for grazing or in areas used largely for dairy fa ing? Why? Do you think we will find more people in areas whi are largely mountainous or areas which are largely level? In moist areas or dry areas? Why? What other factors do you thi might affect where people live?

Show pupils the map of population density in Borchert. Ask th to read the key in order to interpret the map. Also show maps of landforms and of agricultural activities. Ask: Were your guesses correct? Show pupils picture of modern town built in desert because of climate. Ask: Why do you think people went to so much effort to build this town in this desert area?

lirve up and down the blocks, so that
f the streets. Let pupils count the
. How many houses were found in the
r school area? If the number is more
nk that more than 50 people live in

s and the number of square miles with-
gure out the average number of people
higher or lower than the average of
he country as a whole? What might ac-
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ulation density for their state. Is
the population density in their square
will be much smaller. In rural areas
How can you explain the difference?

find more people in areas which are
in areas used largely for dairy farm-
e will find more people in areas which
areas which are largely level? In
Why? What other factors do you think
ive?

ulation density in Borchert. Ask them
interpret the map. Also show maps
tural activities. Ask: Were your
ls picture of modern town built in
Ask: Why do you think people went
this town in this desert area?

Map of population density using color layers (See Borchert and McGuigan, Geography of the New World, p. 17.
Maps of landforms and agricultural activities. See above.
e.g. National Geographic, May, 1966, pp. 616-617.

G. Moist areas tend to have a higher population density than dry areas. However, population distribution reflects man's values and his technology as well as physical features of an area.

G. Man changes the character of the earth.

A. IS SCEPTICAL OF THEORIES OF SINGLE CAUSATION IN THE SOCIAL SCIENCES.

G. Man uses his physical environment in terms of his cultural values, perceptions, and level of technology.

G. A number of factors ---climate, surface features, natural resources, accessibility, and history -- affect settlement patterns.

G. Unevenly distributed phenomena form distinctive patterns on the map.

c. There are more people in some states than in others; for example, there were 350 people per square mile in New York in 1960, 42 in Minnesota, and 3 in Nevada.

d. In general population densities are highest in the eastern third of the country and on the west coast and lowest in desert and high mountain regions.

83. Give pupils figures on population density in New York, Minnesota, and Nevada. How do they account for the difference?

84. Have pupils look again at the map of population distribution in Borchert. Have them generalize about patterns of distribution by asking such questions as: In what parts of the country do we find the largest number of people? The smallest number of people? Have pupils summarize some of reasons for settlement patterns.

S. Interprets pictographs and bar graphs.

3. The population of this country has been growing rapidly but states are growing at different rates.

S. Interprets pictographs and bar graphs.

S. Draws inferences from a comparison of different map patterns of the same area.

G. A number of factors -- climate, surface features, natural resources, accessability, and history -- affect settlement patterns.

G. Large cities are characterized by a large number of people per square mile.

85. Now have pupils conpare the map in Borchert with either a
using dots to show population density or one which uses ma
more color or haching to show differences within states ar
urban concentrations. Ask: What does this map show which
Borchert map does not show?

86. Show pupils a graph of population in the U.S. in 1930, 194
1950, and 1960. (Use a bar graph and a pictograph which u
symbols of same size.) Perhaps show the pictograph first,
then project a bar graph overlay over the pictograph to he
pupils learn to read the bar graph.

87. Show pupils either: (a) a pictograph -- bar graph overlay
showing the growth of population in selected states such a
California, Minnesota, North Dakota, New York, and Arkansa
or (b) two maps showing the population densities of the Un
States in 1930 and in 1960.

88. Have pupils look at a map of their own state and find out
where the places are which have the heaviest population.
They will find that the dot or more complicated map shows
fairly clearly that the places most heavily populated are
urban or city areas. Perhaps have pupils look at some of
pictures in Borchert which illustrate some of the featur

ne map in Borchert with either a map tion density or one which uses many show differences within states and k: What does this map show which the v?	Informative classroom Picture set on The Northeast, plate 16.
pulation in the U.S. in 1930, 1940, ar graph and a pictograph which uses erhaps show the pictograph first and overlay over the pictograph to help bar graph.	Teacher-made Pictograph-bar graph overlay showing growth in population in U.S.
a pictograph -- bar graph overlay ulation in selected states such as rth Dakota, New York, and Arkansas; ne population densities of the United 0.	
of their own state and find out have the heaviest population. ot or more complicated map shows aces most heavily populated are haps have pupils look at some of the illustrate some of the features	See such pictures on pp. 2, 3, 5, 15, 30, 38, 46, 47 in Borchert and McGuigan, Geog.

S. Sets up hypotheses.

S. Interprets circle graphs.

4. There has bee
tion from rur
the last fift

S. Applies previously-learned concepts and generalizations to new data.

G. Some things can be produced better in one place than in another because of climate, resources, transportation routes, access to resources, access to markets, people's skills, etc.

G. Some things can be produced better in one place than in another because of climate, resources, transportation routes, access to resources, access to markets, etc.

D. The location of
by a variety of
resources needed
power sources, t
to markets, sour

a. Minerals and
unevenly arou
must be locat
easily if the
so compete wi

b. Certain kinds
located in pa
agricultural
duction.

4. There has been a decided shift of population from rural areas to urban areas over the last fifty years.

D. The location of industrial centers is affected by a variety of factors such as location of resources needed for production, location of power sources, transportation routes, access to markets, source of labor supply, etc.

a. Minerals and power resources are spread unevenly around the country. Industries must be located where they can obtain them easily if they are to keep their costs low so compete with other firms.

b. Certain kinds of processing industries are located in part because of easy access to agricultural products used in their production.

of heavily populated urban areas as compared to rural areas which are very lightly populated.

89. Say: Not long ago we looked at a chart which showed that the number of farms in the U.S. is declining. What do you think this means about the proportion of people living in rural areas and in cities or urban areas?

Have pupils look at pictographs showing changes in rurual-urban population from 1910-1960. (Make graphs for 1910, 1920, 1930, 1940, 1950, and 1960.) Make sure that pupils can read the first graph and then ask them what changes they see in the percentage of the population living in rural areas over the years. What reasons can they think of for this change when climate and topography have not changed? Review what pupils learned in eariler grades about economic changes which might have brought about this movement of people to the urban areas.

90. Show pupils a map of industrial centers of the country and ask: Why do you think these industries are located in these places? What factors would those who build factories consider in deciding where to build a factory? (If pupils have had the Center's fourth grade course review what pupils learned in unit one about factors affecting the location of industry. Otherwise use several of the activities suggested in that unit to develop some understanding of these factors.

91. Make a collection of labels from tin cans and freezer boxes which show where the food was processed. An attractive display could be arranged. Enter the processing companies who sell the goods i your area on a large outline map of the U.S. Count the number

reas as compared to rural areas
ated.

of the New World.

at a chart which showed that the
s declining. What do you think
on of people living in rural
areas?

hs showing changes in rurual-urban
lake graphs for 1910, 1920, 1930,
sure that pupils can read the first
changes they see in the percentage
rural areas over the years. What
this change when climate and
Review what pupils learned in
changes which might have brought
to the urban areas.

Data for graphs available in World Almanac.

al centers of the country and ask:
ries are located in these places?
build factories consider in decid-
(If pupils have had the Center's
at pupils learned in unit one about
n of industry. Otherwise use
gested in that unit to develop some
s.

Map in Goode's atlas.
Map in Deasy, et. al., The World's Nations.

rom tin cans and freezer boxes which
ssed. An attractive display could
ssing companies who sell the goods in
map of the U.S. Count the number

G. Power for industry is obtained from the use of coal, oil, natural gas, water, wind, and nuclear energy.

S. Draws inferences from a comparison of different map patterns of the same area.

S. Draws inferences from a comparison of different map patterns.

G. Forests can be used to obtain lumber and other timber products such as paper, turpentine, nuts, etc., depending upon the kinds of trees in the forest.

c. Other kinds of processing industries grow up close to sources of timber or fishing areas.

of such companies, and have pupils examine the map to notice where the companies are found in relationship to their town or to each other, and to farm areas growing products used. Discuss the pattern of such companies on the map.

92. Project maps of iron, coal, and oil resources, of several other mineral resources, and of railroads and water routes. Have pupils note relationships between resources, transportation routes and centers of industries using the minerals and power. For example, have pupils examine the Birmingham area. Also have pupils examine a map of cities over 100,000 people to see in what parts of the country urban areas are the largest. Are these urban areas all large industrial areas? Also discuss: What are some other sources of power besides coal and oil? Show pictures of water power resources and perhaps of atomic reactor plant.

93. Project a map showing major type of economic activity in different parts of the county. Ask: Why do you think this type of activity is important in this area? (Most of this discussion should be review. However, pupils should analyze reasons for location of lumbering industry and fisheries processing industry in certain areas.) You may also wish to use one or more of the following activities.

a. Have a committee prepare a bulletin board display on "Industires Which Use Forest Products."

b. Have a committee locate and project pictures illustrating various economic activities related to fishing (fishing boats, processing plants, etc.)

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relationship to their town or
growing products used. Discuss
the map.

il resources, of several other
ds and water routes. Have pupils
ces, transportation routes and
inerals and power. For example,
m area. Also have pupils ex-
0 people to see in what parts
e largest. Are these urban
Also discuss: What are some
al and oil? Show pictures of
of atomic reactor plant.

Maps in Goode's atlas.
Deasey et.al., The World's Nations, pp. 89, 123, 117, 29, 55, 83.
Informative Classroom Pictures. Set on South, plate 23 (shows Norris Dam.) Set on the Northeast, plate 30. (Shows cornfields in U.S.)

of economic activity in differ-
hy do you think this type of
a? (Most of this discussion
s should analyze reasons for
d fisheries processing industry
wish to use one or more of the

e.g. Deasey, et. al., The World's Nations, p. 24.

letin board display on "Indus-
s."

roject pictures illustrating
elated to fishing (fishing boats,

See issues of National Geographic's such as May, 1965, pp. 636 ff.

G. Regions are delimited on many different bases, depending upon the purpose of the study. Some are delimited on the basis of a single phenomenon, some on the basis of multiple phenomena, and some on the basis of functional relationships.

G. A region is an area of one or more homogenious features. The core area is highly homogenious, but there are transitional zones where boundaries are drawn between different regions.

S. Develops a system of regions to fit a particular purpose.

IV. The United S
for further

A. The geogr
a means o
pose of s
the basis
upon his

1. Region
one fa
market

2. Region
of mul
econom

IV. The United States can be divided into regions for further study.

A. The geographer draws regional boundaries as a means of delimiting an area for the purpose of study. He can identify regions on the basis of different factors, depending upon his purpose.

1. Regions may be developed on the basis of one factor such as climate, landforms, market, etc.

2. Regions are often orgainzed on the basis of multi-factors, e.g. landforms, climate, economic activity.

94. Say: We have studied a number of physical and man-made feat of our country. However, we have been looking at the count as a whole without studying any one place in great detail. are going to turn in following units to a study of differer regions in our country. Before we do, we need to know what raphers mean by regions and how they decide how to divide t country up into regions for further study.

Use one or more of the following activities to help pupils stand the concept of regions and different types of regions might be developed.

a. Have students draw individually rough sketch maps of the of ground on which the school stands and ask them to dev descriptive names for the areas (i.e. area occupied by t school people, parking area, playground, bicycle area, e Keep emphasizing that what they are doing is "regionaliz the immediate area. Point out that while each of these gions" has more than one use, they usually have identifi the major one. Since larger areas are used variously, c iating a single use if farm more difficult.

b. Review what pupils have learned earlier about some of th patterns they have studied. What did they discover abou lines were drawn between different physical features? ab areas in which some physical features are found within z indicated for other features? Discuss the idea of core transitional zones in a region. Now use the gorcery sto ample suggested in the background paper for this unit. a pupil draw a map of a local grocery store from memory. gionalize this store. Are there any places where some are found together? Label them transitional zones. Lab core areas of regions.

Also see various sets from Informative Classroom Pictures.

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we have been looking at the country
g any one place in great detail. We
wing units to a study of different
efore we do, we need to know what geog-
d how they decide how to divide the
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hat they are doing is "regionalizing"
int out that while each of these "re-
e use, they usually have identified
arger areas are used variously, delin-
farm more difficult.

learned earlier about some of the map
ied. What did they discover about how
n different physical features? about
sical features are found within zones
tures? Discuss the idea of core and
region. Now use the gorcery store ex-
background paper for this unit. Have
local grocery store from memory. Re-
Are there any places where some things
bel them transitional zones. Label others

3. Functional regions are identified to show regions characterized by certain relationships.

c. Dispaly a land use or zoning map of your city or town. What is the purpose of zoning? Where are the residential areas located? Are the industrial areas contiguous with the class A residential areas? Where are the businesses located? For what is your city noted? What percentage of your city is devoted to this speciality? What percentage to residential areas? Attempt to develop the idea of the great variability in an area.

d. Examine a land use map of Minnesota. How is most of the land utilized in the southern section of the state? Northern section? Twin Cities area? What is our states speciality? What "regions" could our state be divided into?

e. Obtain maps of your own school district and of neighboring school districts and have pupils note the boundary lines. Frequently, they include more than just one community. Help pupils understand how these boundary lines separate functional regions -- divided according to educational services.

f. Obtain a map of federal reserve districts, locate the main office of the pupils' own district, and show pupils how the boundaries between districts indicate functional divide functional regions.

g. If pupils live in a large city, it may be possible to obtain from the business office of a large newspaper a map showing the area within which it sells newspapers. Hopefully, data could be obtained to show how the number of papers sold dwindles off in an area where sales of other newspapers picks up.

h. If pupils live in a small town, have several committees visit local grocery store owners or managers. They should use a map and find out how far in the direction of other towns the stores' customers come. (This may not be possible, but the owner will probably have some idea. If the store is not a chain store and grants credit, the owner is more likely to have this information.) Pupils could then draw in a rough boundary on their map to show the functional region as in-

S. Develops a system of regions to fit a particular purpose.

S. Draws inferences from a comparison of different map patterns of the same area.

B. The United State
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B. The United States can be divided into regions in a number of different ways, depending upon the purposes of the geographer.

1. Geographers frequently regionalize the country on the basis of a single or just several factors.

2. The United States is sometimes divided into the following multi-factor regions; Northeast, South, Midwest, and West. These regions may be examined to decide whether or not the basis for such regionalization is consistent and whether or not the areas included seem to be homogenious or should be regionalized in different ways.

dicated by grocery store sales of their town as aginst regions served by other towns.

95. Say: A region, then, is an area on the earth's surface which is different from other areas in one or more ways. Geographers study maps to identify places which are different. They draw possible regional boundaries on the basis of certain factors, and then they study the regions in more detail to find out more about why they differ from other regions.

Now divide the class into groups and have each group try to regionalize the United States in terms of one criterion such as landforms. Discuss group suggestions, and then have each group regionalize the country on the basis of other criteria such as population;density (including both total population and degree of concentration in large urban centers); growing season; moisture; types of crops and farm animals; major economic activities, etc. Compare the different groups' systems of regionalization on each of these criteria. Ask: Why did you draw your boundaries in these places? Where the systems differ, discuss reasons for differences.

See maps listed earlier.

96. Now say that geographers have tried to consider a large number of factors such as these and to divide the country up into regions for further study. If you were going to develop only one system of regions and wanted to indentify major differences you might consider such factors as population, major economic activities, types of agriculture, mining activities, and industrialization. Now let groups try to regionalize the United States using all of these characteristics. Compare their results, letting each group explain its boundary lines. Then show them a system of regions used in one textbook and comapre it with one used in another textbook. Do both texts agree? Why not? Does either text agree with their system of regionalization? Why or why not? help pupils see that different systems of regionaliza-

See maps listed earlier.

A. IS CURIOUS ABOUT SOCIAL DATA.

S. Sets up hypotheses.

S. Draws inferences from a comparison of different map patterns of the same area.

G. Phenomena are distributed unequally over the earth's surface, resulting in great diversity or variability from one place to another. No two places are exactly alike.

G. People in most societies of the world depend upon people who live in other communities, regions, and countries for certain goods and services and for markets for their goods.

S. Uses meridians and parallels to identify directions on maps.

S. Uses map scales (graphic) to estimate distances.

S. Interprets map symbols (color layers) in terms of map legend.

S. Checks hypotheses against data.

tion can be used, and they will study one of them but will come back at the end of their study of the United States to decide if they would prefer to regionalize the country differently.

97. Using Borchert's system of regionalization as a basis, show pupils a series of maps (either regional or U.S.) and focus first upon the Northeast region. Have them examine the maps and hypothesize about what they would see if they were to take a trip from Washington, D.C. to Pittsburgh. Then have them read the description of such a trip in Borchert to check on their hypotheses. Do the same thing with the other regions, having pupils set up hypotheses before reading the description in Borchert. (By having pupils use wall maps and maps in a number of textbooks, you can arrange things so that different groupps need to use the copies of Borchert at different times. Then this activity is possible with only a classroom set of the Borchert texxtbook.) This activity provides an overview of the diversity of regions and further understanding of the interrelationship of phenomena within each region.

Borchert and McGuigan, Geog. of the New World, pp. 11-40.

G. Phenomena are distributed unequally over the earth's surface, resulting in great diversity or variability from one place to another. No two places are exactly alike.

G. People in most societies of the world depend upon people who live in other communities, regions, and countries for goods and services and for markets for their goods.

S. Draws inferences from pictures.

S. Interprets map symbols.

G. Geographers seek information about areas on the earth's surface which enables them to compare, synthesize, and generalize about these areas.

VII. The geographer studies how places differ and what makes one place different from another; he uses a number of tools of analysis.

A. He is interested in how places differ and in what makes one place different from another.

B. The geographer's basic tool is the map, although he also uses some other tools and techniques.

98. Or view and discuss the film: GEOGRAPHY OF THE UNITED STATES AN INTRODUCTION. This film emphasizes the fact that although each of the regions of the United States is different, it is these differences that help to make our country strong. Provides a good review for seeing the "whole picture."

99. Now have pupils do exercises involving interpretation of coupled pictures of different mountains, different types of grazing lands, different valleys in different climates, and indications of different population densities. These exercis should help pupils interpret map symbols and keep in mind different map patterns in the U.S.

Culminating Activities

100. Divide the class into groups and let each tape its discussio the following questions:

a. What is a geographer and what does he do? (What is he in ested in studying? How does he study it?)

b. What are maps and why are they used to present data inste of just describing the data in words? What are some of t limitations of maps?

film:, GEOGRAPHY OF THE UNITED STATES: film emphasizes the fact that although, the United States is different, it is help to make our country strong. Pro- seeing the "whole picture."	Film: Geography of the United States: An Introduction, 1½ reels, Coronet.
cises involving interpretation of ferent mountains, different types of t valleys in different climates, and t population densities. These exercises rpret map symbols and keep in mind in the U.S.	Borchert and McGuigan, Geog. of the New World, 42-44.
roups and let each tape its discussion of :	Several tape recorders.
and what does he do? (What is he inter- How does he study it?)	
y are they used to present data instead he data in words? What are some of the	

1. He examines maps of single features to notice differences and patterns.

2. He compares different patterns of the same place to find possible relationships.

3. He develops systems of regions.

4. He collects data for his maps through field study, aerial photography, etc.

S. Increases the acurracy of his observations through the use of devices to promote reliability such as a questionnaire.

A. IS CURIOUS ABOUT SOCIAL DATA.

101. Ask: How do you think the geographer collects the data needed for his maps? Discuss possible ways, reviewing ways in which they have made simple maps of their own neighborhood. Also remind them of aerial photographs which they have studied and compared with actual maps of an area. How might the photographs be used to make the maps? Show class more maps made from aerial photographs. Then have the class collect data for a type of map not made before. (e.g. A map showing population density in their neighborhood, with information collected by door to door questionnaire about number of people in dwelling. Another map made of single-family dwelling units, duplexes, and apartment houses in the same area. These two maps can be compared for possible relationships.) Now look back at some of the maps pupils have used so far during this year. Let pupils discuss possible ways by which the information on each might have been collected.

102. Perhaps have several pupils give reports on stories of how geographers have collected certain kinds of data, particularly data about natural environments for purposes of making maps. Old issues of National Geographic, etc., should prove useful sources of information for problems facing geographers in mapping parts of the earth.

S. Tests hypotheses against data.

103. Remind pupils of the hypotheses which they set up early in the unit about the possible effects of the size of the U.S. upon various factors. Show them the list and let them check their hypotheses against the data which they have now studies. Ask: Do you think that size itself was really responsible for some of these things? What other factors were also important.

Alabama	212	116	99	142	48.69	89.45
Arizona	10	7	3,834	5,558	15.13	48.53
Arkansas	182	95	103	173	60.18	109.19
California	137	99	267	372	154.32	353.12
Colorado	46	33	883	1,162	31.93	52.94
Connecticut	16	8	884	107	247.77	444.13
Delaware	7	5	114	146	114.11	235.98
Florida	57	45	290	338	75.23	217.72
Georgia	198	106	130	185	43.28	97.08
Idaho	40	34	328	452	69.82	111.69
Illinois	195	155	159	196	174.15	315.87
Indiana	167	128	118	145	136.90	265.02
Iowa	203	175	169	194	160.71	253.82
Kansas	131	104	370	481	65.80	100.04
Kentucky	218	151	89	113	80.87	135.37
Louisana	124	74	90	139	82.21	170.63
Maine	30	17	138	178	54.17	83.11

*Source: Department of Commerce, Bureau of Census; U.S. Census of Agriculture: 1959, Vol. II.

NUMBER AND ACREAGE OF FARMS*

Farms - Number and Acreage by States 1950 to 1959

Value of Land per Acre 1950 to 1959

STATE	Number of Farms (1,000) 1950	1959	Average Acreage Per Farm 1950	1959	Acreage Value Per Acre (Dollars) 1950	1959
United States	5,389	3,711	216	303	64.96	115.08
Alabama	212	116	99	142	48.69	89.45
Arizona	10	7	3,834	5,558	15.13	48.53
Arkansas	182	95	103	173	60.18	109.19
California	137	99	267	372	154.32	353.12
Colorado	46	33	883	1,162	31.93	52.94
Connecticut	16	8	884	107	247.77	444.13
Delaware	7	5	114	146	114.11	235.98
Florida	57	45	290	338	75.23	217.72

STATE	Number of Farms (1,000) 1950	1959	Average Acreage Per Farm 1950	1959	Acreage Value Per Acre (Dollars) 1950	1959
Maryland	36	25	112	138	125.07	284.12
Massachusetts	22	11	75	102	189.54	310.14
Michigan	156	112	111	132	98.52	193.15
Minnesota	179	146	184	211	84.46	154.22
Mississippi	251	138	82	135	55.42	105.97
Missouri	230	169	153	197	63.66	112.40
Montana	35	29	1,689	2,213	16.86	34.69
Nebraska	107	90	443	528	57.62	88.66
Nevada	3	2	2,271	4,649	19.24	30.54
New Hampshire	13	7	128	172	72.85	105.90
New Jersey	25	15	70	89	292.84	520.12
New Mexico	24	16	2,014	2,908	15.01	23.46
New York	125	82	128	164	91.62	146.13
North Carolina	289	191	67	83	98.65	185.61
North Dakota	65	55	630	755	28.86	51.63
Ohio	199	140	105	132	136.34	247.11
Oklahoma	142	95	253	378	51.42	83.86

Montana	35	29	1,689	2,213	16.86	34.69
Nebraska	107	90	443	528	57.62	88.66
Nevada	3	2	2,271	4,649	19.24	30.54
New Hampshire	13	7	128	172	72.85	105.90
New Jersey	25	15	70	89	292.84	520.12
New Mexico	24	16	2,014	2,908	15.01	23.46
New York	125	82	128	164	91.62	146.13
North Carolina	289	191	67	83	98.65	185.61
North Dakota	65	55	630	755	28.86	51.63
Ohio	199	140	105	132	136.34	247.11
Oklahoma	142	95	253	378	51.42	83.86
Oregon	60	43	340	499	59.82	87.42
Pennsylvania	147	100	96	119	107.19	184.65
Rhode Island	3	1	74	99	232.02	379.98
South Carolina	139	78	85	117	69.06	134.01
South Dakota	66	56	674	805	31.30	50.76
Tennessee	232	158	80	102	77.26	130.30
Texas	332	227	439	631	46.21	82.11

STATE	Number of Farms (1,000) 1950	1959	Average Acreage Per Farm 1950	1959	Acreage Value Per Acre (Dollars) 1950	1959
Utah	24	18	449	712	43.37	59.50
Vermont	19	12	185	243	55.68	81.49
Virginia	151	98	103	135	82.01	138.60
Washington	70	52	249	363	84.64	131.14
West Virginia	81	44	101	138	59.31	74.27
Wisconsin	169	131	138	161	88.58	132.16
Wyoming	13	10	2,729	3,715	13.21	21.39

Table of Elevations (in feet)

Akron, Ohio	1,200	Hartford, Conn.	58
Albany, N.Y.	20	Indianapolis, Ind.	845
Albuquerque, N.M.	4,950	Jacksonville, Fla.	20
Allentown, Pa.	230	Kansas City, Mo.	1,020
Altoona, Pa.	1,171	Knoxville, Tenn.	890
Amarillo, Tex.	3,678	Lincoln, Neb.	1,189
Ann Arbor, Mich.	820	Little Rock, Ark.	330
Atlanta, Ga.	1,086	Los Angeles, Calif.	5,074
Atlantic City, N.J.	7	Louisville, Ky.	761
Baltimore, Md.	489	Madison, Wisc.	861
Billings, Montana	3,117	Minneapolis, Minn.	980
Birmingham, Ala.	1,060	Nashville, Tenn.	498
Bismark, N.D.	1,670	New Orleans, La.	25
Boston, Mass.	330	New York, N.Y.	575
Buffalo, N.Y.	699	Omaha, Neb.	1,272
Butte, Mont.	5,767	Phoenix, Ariz.	1,160
Charleston, S.C.	10	Portland, Ore.	1,073
Cheyenne, Wyo.	6,060	Sacramento, Calif.	30

Baltimore, Md.	489	Madison, Wisc.	861
Billings, Montana	3,117	Minneapolis, Minn.	980
Birmingham, Ala.	1,060	Nashville, Tenn.	498
Bismark, N.D.	1,670	New Orleans, La.	25
Boston, Mass.	330	New York, N.Y.	575
Buffalo, N.Y.	699	Omaha, Neb.	1,272
Butte, Mont.	5,767	Phoenix, Ariz.	1,160
Charleston, S.C.	10	Portland, Ore.	1,073
Cheyenne, Wyo.	6,060	Sacramento, Calif.	30
Chicago, Ill.	673	St. Louis, Mo.	614
Cleveland, Ohio	1,050	Salt Lake City, Utah	4,390
Dallas, Tex.	686	San Francisco, Calif.	934
Denver, Col.	5,470	Seattle, Wash.	520
Des Moines, Iowa	805	Washington D.C.	410
Detroit, Mich.	672		
Duluth, Minn.	610		
Gary, Ind.	590		

1830

MAKING "GEOGRAPHY GUESSES"

When you were a child you spent much time each day asking your mother many questions. Most of these questions were asking "Why" or "How"! For instance you may have asked, "Why is the sky blue, Mother?" or "How do the birds find their way back each year?" And mother, knowing that you must ask questions in order to learn, would do her best to explain the "how" and "why" of your questions. As you grew older and learned how to read, you began to look in books for the answers to your questions. You probably soon discovered that all of your questions could not be answered definitely. You either had to admit that you just couldn't find the answer. Or you had to guess what was the truth from the information you did find.

Let us apply this search for answers to the discovering of information about a city your family plans to visit. Suppose that your home is in St. Paul. Your family wants to take a vacation trip to Seattle, Washington. You were asked by your family to find out what that city is like. Where would you begin to look for information? Perhaps you would try to find someone who had been there and ask him. Or maybe you might check in encyclopedias or other reference books. Where else might you check? Could you use a map? What type of information could it provide? Examine a map of the United States. Make a list of all of the things you could definitely say about Seattle just by studying the map.

There are some things which a map does not tell you definitely. You have to guess about these things. For example one of the guesses you might make about Seattle is that many of the people living there spend their vacations in the mountains. Make a list of "guesses" about Seattle based on your study of the map.

Maps can provide much information about an area if one knows how to read them. But where else might you find infromation about Seattle? Could you use pictures? Your first task in studying a picture is to identify the things shown in it. The next step would be to describe what is going on in the picture. Finally, you should ask yourself questions about the picture and make guesses about what the items in the

picture reveal about Seattle. For example, suppose you were to look at a picture of Seattle which shows many huge ocean liners from other countries. You could probably say something quite definite about the size of the port of Seattle. You might say that Seattle carries on trade with foreign countries. You might even guess what was being traded or which of the countries Seattle trades with the most. By examing other pictures you might discover what most of the people do for a living, how the people are like us, and how they are different.

By now you should be convinced that you can learn a lot about a place by reading maps, examing references, studying pictures, and asking people who have been there. But did you know that geographers gain much of their information by using the same tools as you did? They do. They also use a few additional tools that you will become familiar with as you study the various regions of the world this year. In fact your main task will be the using of these tools to make "educated guesses" about what an area is really like.

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Knight, David C., The First Book of Deserts. New York: Franklin Watts, Inc., 1964.

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Swartzlow, Carl R. and Robert F. Upton, Badlands National Monument. (National Park Service Booklet). Washington, D.C.: Government Printing Office, 1954, 25¢.

B. Articles

Idyll, Clarence P. and Robert F. Sisson, "Shrimp Nursery: Science Farms the Sea," National Geographic, May, 1965.

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II. Materials to be Used by Teacher as Source for Maps, Pictures, and Diagrams.

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Audio-Visual Materials
(Other than wall maps, films and filmstrips which are cited within unit)

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Set on The South
Set on The Northeast
Set on The West
Set on New England
Set on Great Plains

B. Charts and Models

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Map Symbols and Geographic Terms Charts, A.J. Nystrom, Chicago.

U.S.G.S. Raised Relief Quadrangles A.J. Nystrom, Chicago.

C. Map Transparencies

Map transparencies, A.J. Nystrom Co., Chicago (Aero-View transparencies).